Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
PRINTING
FINISHING

NOVEMBER 17, 1947
VOLUME 36, No. 23

AMERICAN DYESTUFF REPORTER

NOV 22

There is no compromise...

when the best in fastness to light is required—*Solophenyl** Colors are the fastest of all Direct dyestuffs.

Only the fastest to light Direct colors are permitted to carry the name Solophenyl.

**Reg. U. S. Patent Office.*

GEIGY COMPANY, INC.

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Geigy
Dyestuff Makers Since 1859

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In Great Britain
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OFFICIAL PUBLICATION
of the
PROCEEDINGS
AMERICAN ASSOCIATION
OF TEXTILE CHEMISTS
AND COLORISTS

CUT YOUR PROCESSING COSTS

WITH Cyanamid SULPHONATED OILS

A Wide Range of Superior Oils

is becoming more generally available as Cyanamid's channels of raw material supply continue to open up.

AMONG CYANAMID PRODUCTS FOR THE TEXTILE INDUSTRY ARE . . .
AQUASOL* Sulphonated Castor Oils, NO-ODOROL* Finishing Oils, DECERESOL* OT Wetting Agents, Penetrants, Softeners, Finishes, Sizing Compounds, PARAMUL** 115 Water Repellent, and other specialties and Heavy Chemicals.

For low-cost chemical equivalent of distilled H_2O . . . FILT-R-STIL* Demineralizing Units.

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Yes! Cyanamid sulphonated oils will help you cut right through one of your most pressing problems. For when you use Cyanamid sulphonated oils, you put increased efficiency and dependable performance to work *cutting your costs* by improving your processing. For the absolute uniformity and high quality of Cyanamid oils—made possible through large-scale production methods—eliminate costly guesswork and help achieve excellent results every time.

Industrial Chemicals Division
AMERICAN CYANAMID COMPANY

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Ciba DYESTUFF GLIMPSES

The first steps in the manufacture of modern dyestuff are the intermediates, themselves the result of a long and intricate process. These components are blended together in huge vessels where chemical reactions which yield the dye take place.

At once, as if by magic, in the clear colorless liquid a brilliant dye appears as a fine colored precipitate.

This must be pumped into a filter press and forced through sieve after sieve which hold back the dyestuff and allow the liquid to flow through. When the presses are opened and the filter frames are pushed aside, we see the closely packed cakes of color in gleaming full shades.

There are also other ways of filtering. Sometimes the dyestuff is made to pass through enormous containers with a bottom of porous stone through which the liquid percolates leaving the dyestuff behind.

A strange, picturesque, romantic world, is this dye-making factory, with its mighty pressing machinery, huge containers and vats of shimmering colors. One might well forget, while gazing at this scene of large scale production, that here we have the visible fruit of subtle scientific thought.

DYESTUFFS • CHEMICALS • INTERMEDIATES

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VAT DYES OF THE DOW CHEMICAL COMPANY

NEOLANS ON WOOL = SIMPLE PROCESSING . . .
EASY SHADING . . . LEVEL DYEING . . .

ALKANOL* B
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DUPONOL* G
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DUPONOL* 80
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*TRADE MARK

Don't waste time worrying—let Du Pont help take care of your tougher textile problems.

If any of these troubles are yours—it'll be good news to you that there's a Du Pont Surface Active Agent—or a carefully worked out combination of them—for your special need.

Increasing production of Du Pont Surface Active Agents is catching up with demand. Put Du Pont textile research to work for you—*the same day you read this ad!* Fine Chemicals Division, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware. Branch offices: Atlanta, Boston, Charlotte, Chicago, New York, Philadelphia, Providence, San Francisco.

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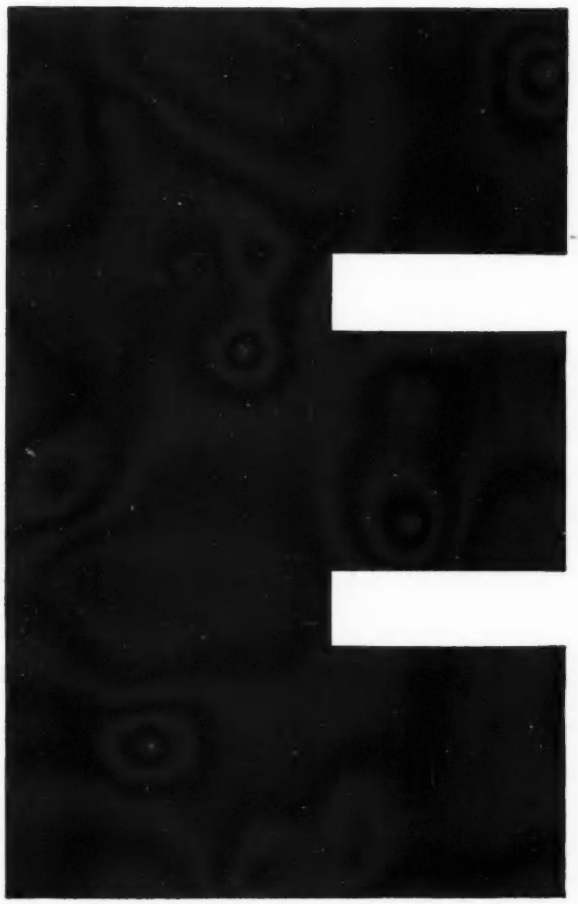
EASTONE BLUE BGF

For Plain or Dischargeable Dyeing of Acetate Rayon Fibers, Fabrics, and Blends

EASTONE BLUE BGF, a highly soluble azo dyestuff, dyes acetate rayon medium-bright shades of blue which are highly resistant to atmospheric gas fading. This Eastone dyestuff penetrates and levels at a somewhat lower temperature than azo blues previously offered, and has excellent build-up properties for both jig and box dyeing at temperatures which range from 180° F to the boil.

Eastone Blue BGF is one of the few blue acetate dyestuffs which are readily dischargeable. It has superior wash-fastness and resistance to dry cleaning, ironing, crocking, and perspiration. In cross-dyeing, it leaves viscose and cotton white. On combinations of acetate with silk and with wool, this dye produces bright shades of blue.

Eastone Blue BGF is one of an expanding line of Eastman Acetate Dyestuffs available in a wide color range for cellulose acetate rayon fibers and fabrics. Additional data on these dyestuffs and their use may be obtained by sending your inquiry to: TENNESSEE EASTMAN CORPORATION (Subsidiary of Eastman Kodak Company), KINGSPORT, TENNESSEE.



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ACETATE DYESTUFFS

From single carboys... to a fleet of tank cars

● Such is the impressive increase in the use of Becco Hydrogen Peroxide over the years. There are reasons for this growth, of course! Outstanding among them are:

- Becco Hydrogen Peroxide meets the specific requirements of industry.
- Becco Hydrogen Peroxide is quickly and easily pumped to the point of use from your storage tanks.
- Becco research has been largely devoted to the improvement of bleaching in the textile industry.

BECCO'S engineers and chemists are prepared to assist you with your bleaching problems — how you may be able to obtain finest results under specific conditions of your operations. Write today!

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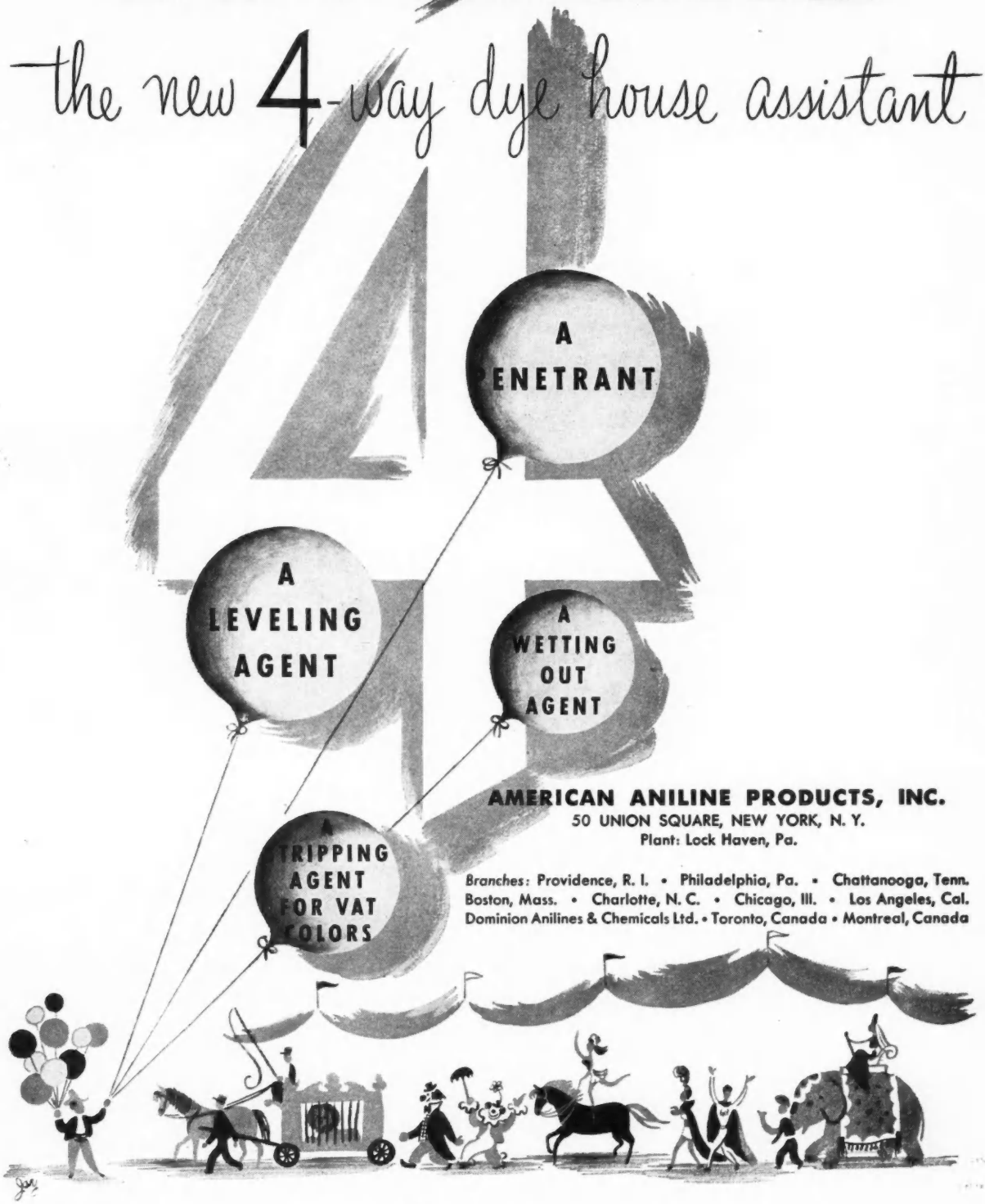
the new 4-way dye house assistant



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SULPHONATIONS REVUE

highlighting that great performer "MONOPOLE"

● Forty-five years experience in producing Sulphonations —that's in back of every one of these star-performers! The oldest producer in the business, Jacques Wolf & Co., takes a special pride in maintaining the strictest laboratory and production controls. That's the reason a Wolf product is always known for its uniform high quality, uniformly successful results.

As the accompanying list shows, we supply all standard sulphonated oils and tallows, and a variety of special products as well. Still heading the list is our famous Monopole Oil, known throughout the industry for its tested results in dyeing and finishing. Introduced over 45 years ago—and like every Wolf product, constantly improved — this great double-sulphonated oil is still leader in its field!

Wolf offers you Sulphonations *as you want them*—in variety, value and performance.

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Monopole Oil	Sulphonated Esters
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And combinations with all types of solvents

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TESTED AND APPROVED

★ VELVAMINE K-90 ★
PERMALENE SOL ★
VELVAMINE GF ★
PERMALENE WS ★

PERMALENE SOL

A penetrant and cleanser designed for use on all fabrics especially those that are tightly woven and highly twisted. Recommended for pad-dyeing where it insures uniform and thorough penetration. It is of great assistance where low temperature dyeings are necessary. Non-foaming at high speeds, it is stable in neutral, alkaline and acid solutions.

VELVAMINE K-90

An improved softening and finishing agent for use on all types of fabrics. It imparts an odorless finish which is resistant to washing and dry cleaning. Can be used as a substitute for sulphonated oils, tallows and other softeners. Its use eliminates yellowing and rancidity often encountered with the usual fatty type of softening agents.

VELVAMINE GF

Velvamine GF is a blend of amines and softeners designed to protect acetate colors from gas or fume fading. It resists removal by drycleaning and, when used on mixed fabrics, has a minimum effect on the shade and light fastness of the direct colors. Velvamine GF produces a soft, full hand and does not affect the appearance of the treated fabrics.

PERMALENE WS

A white powder soluble in water at 80° F. Capable of dispersing iron, calcium and magnesium salts and redissolving or redispersing precipitated compounds of these metals. It is so highly buffered that the pH of its solution is practically independent of its concentration.

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Here Today... **THE WOOL OIL OF TOMORROW!**

Fybrol 1115*

THE ORIGINAL WATER-SOLUBLE WOOL FIBER LUBRICANT

Performance results in mill after mill for more than two years *prove* the superiority of FYBROL 1115 over conventional wool oils... in chemical properties – in economy and ease of application – in what it *does* for the finished fabric.

FYBROL 1115 is a highly sulfonated hydrocarbon... a chemically stable water-soluble oil which forms *not an emulsion* but an opalescent solution. Its instant and complete penetration of fiber preserves staple in carding, prevents static.

All along the production line – picking, carding, spinning, finishing and dyeing – FYBROL 1115 increases mill efficiency, helps make better finished fabrics.

*Patents Pending

PICKING AND CARDING

Wool lubricated with FYBROL 1115 is uniform in condition. Minimum of drying out in storage.

Fybrolized wool holds its weight – no frequent changes in feed to correct for low weights in roving.

Fybrolized wool is not "greasy" Means minimum of stripping, which increases production up to 10%.

SPINNING

Increases spinning production.

Improves strength and elasticity of yarn.

Fybrolized yarn holds its twist.

No odors in storage. No rancidity or oxidized yarns.

FINISHING AND DYEING

Substantial soap savings.

Time saved in fulling, scouring and rinsing.

Imparts maximum body and cover to fabrics in minimum time.

Send for new bulletin giving complete details on FYBROL 1115.

DEPT. D

TEXTILE CHEMICALS DIVISION

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PLANT AND LABORATORIES: NUTLEY, N. J. • *REFINERIES:* PETROLIA AND FRANKLIN, PA.

Sonneborn Processing Specialties for the Textile Industries • Wool and Worsted Oils • Petroleum Sulfonates • Detergents and Dyeing Oils • Penetrants • Delustering Specialties • Warp Dressings • Finishing Sizes and Softeners • Water Repellents • Sulfonated Oils • Wetting and Rewetting Agents

the Safe Bleach—

SODIUM CHLORITE

WON'T DEGRADE PULPS, FATS OR FIBERS

When most standard bleaching agents have oxidized up to a certain point—comes the attack! Fibers are tendered; pulps lose strength; fats revert . . . further bleaching must stop, or be subject to close, costly control.

It's a different story with Mathieson's Sodium Chlorite—and its co-product Chlorine Dioxide—the new bleaching agents which do not degrade pulps, fats or fibers, and hence permit safe bleaching to new highs in whiteness.

Mathieson
SODIUM CHLORITE

Sodium Chlorite Products . . . Chlorine Dioxide
Caustic Soda . . . Soda Ash . . . Bicarbonate of Soda
Liquid Chlorine . . . Ammonia, Anhydrous & Aqua
HTH Products . . . Fused Alkali Products . . . Dry Ice . . . Carbonic Gas . . . Sodium Methylate

WHITE COTTON WITH STRENGTH

Cotton fibers, when bleached with Mathieson's Sodium Chlorite (Textone) and hypochlorite, are not attacked. Thus better whites are possible with no loss of tensile strength . . . solutions need only slight control.

HIGH BRIGHTNESS IN PULP

Paper pulps reach very high brightness levels when bleached with chlorine and chlorine dioxide mixtures. Degrading effects are negligible, and pulp yields are high. The mixed-in chlorine cuts costs.

UPGRADING FATS NOW EASY

Lower grade fats are easily improved to a quality suitable for high-grade soaps, by bleaching with Mathieson's Chlorine Dioxide. No deterioration . . . improved color and odor . . . much higher yields.

Sodium Chlorite—a Mathieson development—is a stable chemical which is used directly for many bleaching and oxidizing purposes . . . or used in conjunction with hypochlorite . . . or as a convenient source of the powerful oxidizing agent, Chlorine Dioxide. Details on the many applications are yours for the asking. Write to: Sales Development Department, The Mathieson Alkali Works (Inc.), 60 East 42nd Street, New York 17, New York.

Henri says . . .

"WAPACO Wool Oil B ees ma cheri. She save my *CHIPPEWA FALLS WOOLEN MILL* much money and much time. Ze reasons?"

WAPACO WOOL OIL B:

1. Gives us CONTINUAL HIGH YIELDS OFF CARD.
2. Eliminates GUMMING of Card Wire and Pitting.
3. Assures SCOURABILITY . . . using less soap and doing a superior job.
4. Allows EXACT ESTIMATE OF PRODUCTION. We process 1500-2500 pounds without stripping cards.
5. Eliminates OXIDATION.
6. Can BE LEFT AROUND INDEFINITELY IN THE GREASE.
7. Produces LESS ENDS DOWN AT THE RUB APRON . . . for more uniformity.
8. PENETRATES . . . does not lie on the surface.
9. MIXES IN HARDEST OF WATERS . . . hot or cold.
10. Allows FIRST BREAKER TO STRIP AS EASILY AS FINISHING BREAKER. Also will strip to base of the wire on all breakers, doffers, workers and strippers.

A *Watson-Park* DEMONSTRATOR WILL BE GLAD TO DISCUSS YOUR PROBLEMS WITH YOU. OR WRITE FOR FURTHER INFORMATION.

WATSON-PARK CO. Wapaco Leads BOSTON, MASS.

FACTORY, LOWELL JCT., MASS.

WATSON-PARK COMPANY
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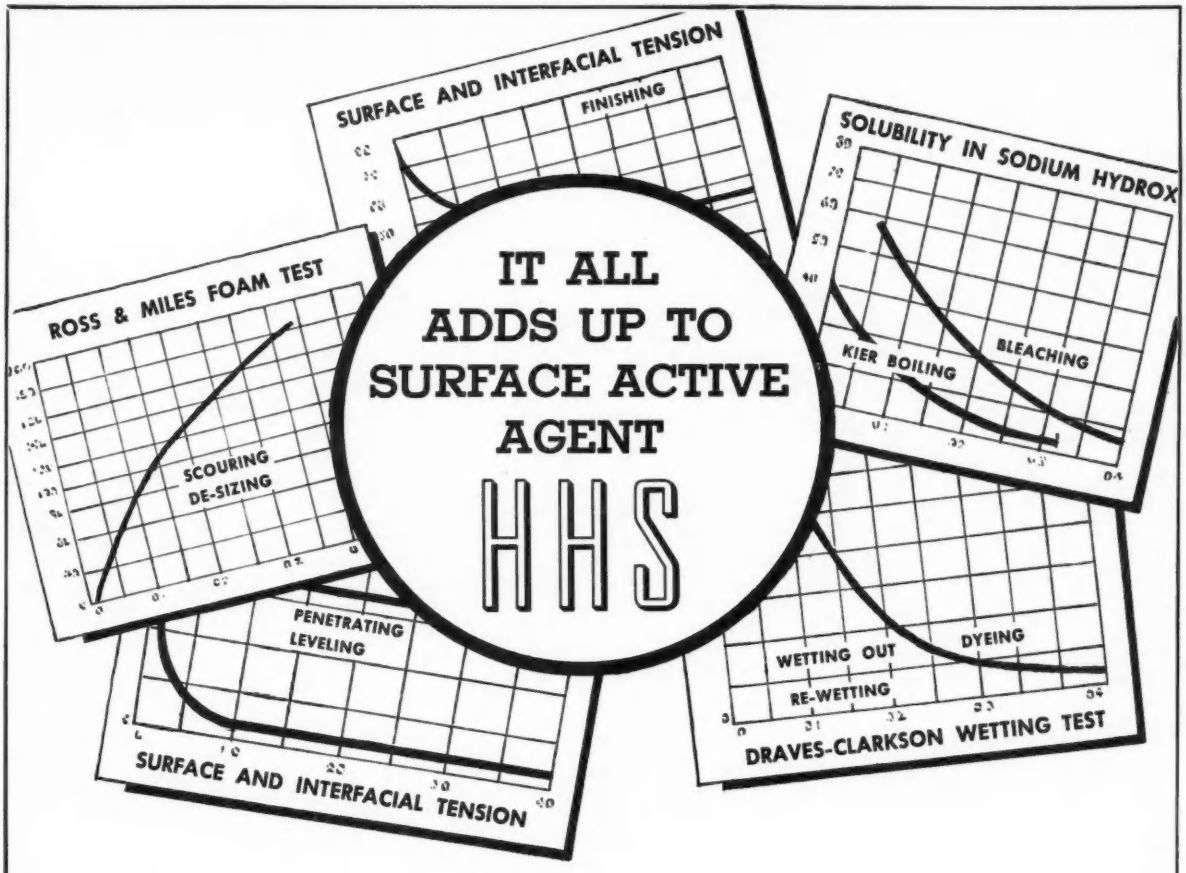

A NEW Organic Chemical Which Improves:

WETTING OUT	DYEING
DE-SIZING	SCOURING
KIER BOILING	RE-WETTING
BLEACHING	FINISHING

Step-up both profits and quality with this new Surface Active Agent. A free testing sample of HHS with complete technical data is yours, upon request. Quantity lots in dry flake form are now available in 125 lb. net drums.

PUBLICKER INDUSTRIES Inc.

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Confidentially, your best bet is Hardesty

It's no secret in the industry that Hardesty delivers the goods. We do not perform miracles but many times our knowledge and experience in fatty acids can help solve the most knotty production problems.

Hardesty products are made in various grades to meet the requirements of the chemical, textile, cosmetic, soap, rubber and other industries. Why not get acquainted with the Hardesty way of doing business now? You'll like our personalized service and we can show you with information and samples why it pays to keep in touch with Hardesty.

RED OIL • GLYCERINE • STEARIC ACID • WHITE OLEINE • STEARINE PITCH • HYDROGENATED FATTY ACIDS • ANIMAL AND VEGETABLE DISTILLED FATTY ACIDS

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BRILLIANT SHADES OF RED • SCARLET • ORANGE • YELLOW • GREEN • BLUE • VIOLET • BROWN • BLACK

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- EASE OF APPLICATION

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GENERAL DYESTUFF CORPORATION

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new, low-cost, fast-wetting—

Tergitol

TRADE-MARK

WETTING AGENT P-28

P-28 is a new, fast-acting TERGITOL wetting agent with plus values for textile processes. It is especially recommended for kier-boiling of cotton and for textile dyeing operations. P-28 is easy to use—like other TERGITOL products it is sold in liquid form.

TERGITOL P-28 is designed to function primarily in water solutions containing concentrations of from 2 to 5 per cent of inorganic salts or 1 to 2 per cent of alkalis. As most vat, basic, or direct dye baths contain 1 to 3 per cent of inorganic salts—in P-28's most effective range—level dyeing is achieved efficiently with *only about 0.1 per cent by volume of* TERGITOL *P-28.*

the story at a glance: You save on processing because you use less TERGITOL P-28 for the same wetting action.

Wetting Action of Wetting Agent P-28
(Draves Test at 26° C.)

Per Cent Concentration Necessary to Give 15-Second Wetting Time	
in 2% NaOH	0.073*
in 1% Na_2SO_4	0.12
in 3% Na_2SO_4	0.091
in 5% Na_2SO_4	0.078*

*Limit of solubility.

Why not effect the savings that TERGITOL P-28 makes possible in your processes? Drum quantities of this low-cost, efficient wetting agent can be supplied now. For samples and prices call or write our nearest sales office—when writing, please address Dept. A-11.

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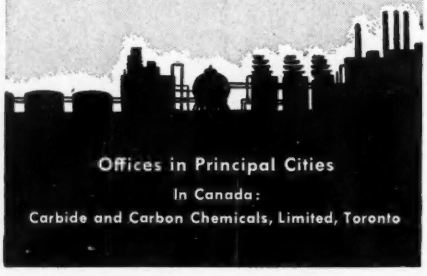
Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.



Offices in Principal Cities

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Carbide and Carbon Chemicals, Limited, Toronto

"Tergitol" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.

Add **COLOR** *and any line moves faster! By its magic, a chunk of wood becomes a seductive bass-plug . . . a bolt of lifeless grey goods shimmers with feminine allure. Nothing else adds so much value at such small cost.*

WHEREVER COLOR IS USED

SPECIFY *National Aniline Dyes*

NATIONAL ANILINE DIVISION
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Ambertex FOR TEXTILE PRINTING

sharp in detail and color

AMBERTEX yields prints with razor sharp detail. It is a grit-free, heavy-bodied printing thickener that is readily diluted to a free-flowing consistency with cold water . . . highly resistant to the thinning-out action of strong alkalis . . . and sufficiently cohesive to hold patterns to the exact proportions of the original engravings.

Unlike ordinary textile gums which usually reduce color values, AMBERTEX actually increases the color yield. It improves the quality of the color paste . . . penetrates the cloth uniformly . . . and rinses readily in cold water.

AMBERTEX is equally suitable for *color printing* acetate, direct, vat, Rapidogen or Pharmasol, and Indigosol or Algosol colors by screen or roller machine; and *white discharge printing* on all types of fabrics.

National also produces: **FLOTEX** to replace natural gums for printing; **FIBERTEX** for textile finishing; **NALEX** for cotton and worsted warp sizing; **FLOJEL** uniform, thin boiling corn starches in all standard fluidities; **HOOSIER** Pearl Cornstarch; **TABLE ADHESIVE** for screen printing

Offices: 270 Madison Avenue, New York 16; Boston, Philadelphia, Atlanta, New Orleans, Indianapolis, Chicago, San Francisco and other principal cities. In Canada: Meredith, Simmons & Co., Ltd., Toronto. In Holland: Nationale Zetmeelindustrie, N. V., Veendam.

Photo Courtesy of COTTON-TEXTILE INSTITUTE

National STARCH PRODUCTS

STARCHES—AND SPECIALTIES WITH EASILY DEMONSTRATED SUPERIORITY

ONYXSAN LG
For Extra Soft, Lasting Hands
On Cotton, Rayon and Bemberg...
This cation-active softening agent, newest item in the famous Onyxsan line, provides extra smooth, soft hands that are *permanent* on cotton, rayon and bemberg, and outstanding in their resistance to washing *on all other fabrics.*
All Onyxsans are easy to use in the jig, quetsch, dye beck, pad, etc. Substantive to textile fibers, small quantities do a big job. Stable to hard water, electrolytes and organic acids. They do not develop rancidity, odors, stiffness or mark-off.
Investigate the versatility of Onyxsan LG
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CHEMICALS FOR DYEING AND FINISHING
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Montreal, Toronto, St. Johns, Que.
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do you know
what is the biggest development
Q. in cotton in 15 years?

it's wrinkle-resistant cotton . . .
just announced by DAN RIVER MILLS
achieved with Monsanto's unique
A. textile chemical, RESLOOM C

Not since the coming of shrinkage control and vat dyeing has anything so important to cottons occurred.

By impregnating the individual cotton fibers with Monsanto's Resloom C, Dan River finishing experts have been able to create a cotton fabric that *really resists wrinkling.*

This new fabric has a crisp, springy "hand" . . . and the wrinkles fall away like nothing ever seen before. Resloom will not wear away or wash away.

First developed, in an interesting new cotton tweed, Dan River expects to carry these new properties into cotton chambrays, ginghams, twills.

Here is an excellent example of what a planned program of cooperation between fabric creator and textile chemical manufacturer will yield.

MONSANTO
CHEMICALS — PLASTICS

For Resloom information address: MONSANTO CHEMICAL COMPANY, Textile Chemicals Department, 140 Federal Street, Boston 10, Massachusetts. Resloom: Reg. U. S. Pat. Off.

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Olate BRINGS OUT THE BEST IN YOUR SYNTHETICS

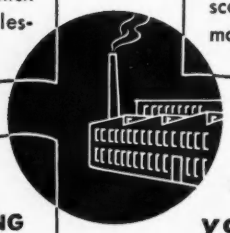
● If synthetic processing is your responsibility, let Olate shoulder part of the load. Olate has a time-tested reputation for exceptional wetting out, detergent and lubricating qualities. This pure, neutral, low titer soap is widely used throughout the industry because of its efficiency, economy, and safety. No other soap can do more to help you turn out quality yarns, hosiery, knitted fabrics or woven piece goods.

FOR YARN FINISHING

You get thorough scouring with Olate . . . rinsing is fast and complete . . . protection against oxidation, rancidity, and odor development is exceptional. Olate-scoured yarns give fabrics the pleasing finish which means so much to the eye-appeal and sales-appeal of the finished product.

FOR HOSIERY SCOURING AND DYEING

Cleansing action starts the minute Olate's fluid solutions penetrate the hosiery. Wetting out is fast and thorough. You get unusual freedom from uneven dyeing with Olate scouring. And Olate costs you far less than most proprietary scouring oils.



FOR SCOURING AND DYEING WOVEN PIECE GOODS AND KNITTED FABRICS

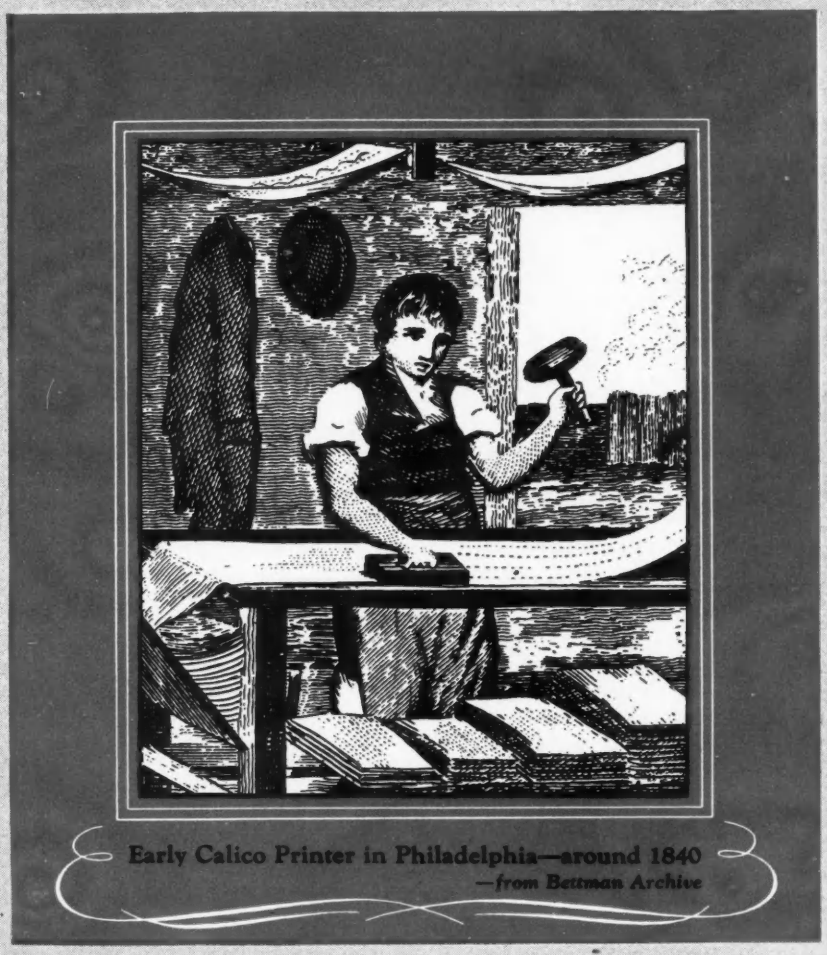
Olate provides exceptional freedom from these common trouble makers—uneven shrinkage, streaks, dye blotches, and chafe marks—because of its rapid wetting out, gentle cleansing action, and excellent lubricating properties. Olate can do much to guard against costly, wasteful tie-ups and rejects.

there's a place in your plant where Olate can help . . . try it!

Olate

Safe and efficient for every soap usage.

● PROCTER & GAMBLE ●



Early Calico Printer in Philadelphia—around 1840
—from Bettman Archive

The speed and dependability of Rapidase in the de-sizing of cottons, rayons and mixed goods are important factors in preparing today's fabrics for dyeing, printing, and bleaching. Its effectiveness over a wide range of pH and temperature is especially desirable in modern finishing practice.

RAPIDASE

WALLERSTEIN COMPANY, INC. **180 Madison Ave., New York 16, N. Y.**

Valuable additions to our line of . . .

Pharmasols

Brown 2G produces a bright yellow Brown of excellent fastness to washing at a low cost.

Brown R produces a warm Brown of general all-around fastness.

Seal Brown yields a deep Brown at low cost and is of good all-around fastness.

THE THREE NEW BROWNS PRODUCE DESIRABLE TAN SHADES WHEN PRINTED IN REDUCED STRENGTH

THESE NEW BROWNS, especially Seal Brown and Brown R, are easy to apply and show a very pronounced improvement in their

FASTNESS TO LIGHT

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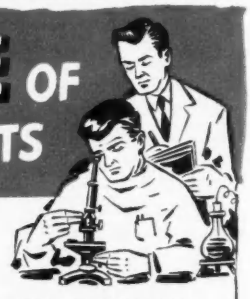

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VOLUME 36 NOVEMBER 17, 1947 NUMBER 23

Spore-Rain Technique for Mildew Resistance Testing

FRANK R. ROMANO
Philadelphia Naval Base Test Laboratory

Introduction

BECAUSE of the need for protecting textile service materials by the armed forces in climates conducive to mildew attack, various methods for testing the mildew resistance imparted by chemical agents were instituted.

Due to the suddenness of the need, however, many methods used were not entirely adequate. At best many of the methods were conducive to compromising results, as evidenced by field failures of laboratory approved materials. Now that the period of urgency has passed, more desirable, accurate and reproducible methods of test can be developed.

The ideal mildew resistance test appears to be one in which the test assembly embodies optimum chemical and physical conditions for growth of the test organisms, wherein the test specimen is the sole source of organic energy material, and mildew attack is limited only by the nature of the treated or untreated material under test.

In proceeding with the test, it would be desirable to have viable fungus spores contact the test specimen continuously to insure that the specimen has been actively under tes throughout the test period. It is necessary, also, that the test specimen be so supported that every surface will be subject to mildew attack—limited only by the nature of the material under test.

The spore-rain technique was developed for the purpose of attempting to meet the desirable conditions required of an ideal mildew resistance test method and to overcome various shortcomings of generally used methods in existence. The novel features of the spore-rain technique are, first, continuous re-inoculation of the test specimen by mildew spores growing on Agar suspended inside the top of the testing chamber; second, the maintenance of aerobic conditions about all surfaces of the test specimen; third, subjection of all surfaces to test in one exposure; fourth, elimination of organic constituents other than those in the test specimen. A description of this method of test follows under Experimental Procedure.

Review of the Literature

Without a doubt desirable test conditions are embodied in many of the presently used mildew-resistance test methods, *(1), (2), (3), (4), (5).*

The soil burial method *(1)* is considered one of the most severe tests employed in determining mildew-resistance. A definite asset inherent in this method is the automatic exposure of all surfaces of the test specimen at the same time, together with the fact that viable spores are present throughout the test period. The soil burial test does, however, at the same time have more uncontrolled variables than any other test for mildew-resistance. It is difficult, if not impossible, for widely scattered laboratories to obtain soils of the same general composition, e.g. with the same ratio of one constituent to another; with similar moisture holding capacities; with a similar ratio of organic to inorganic matter, and most mportant of all, with the same relative amounts and types of microorganisms. Each of the above mentioned factors has its definite and peculiar influence on test results. The soil burial methods, *per se,* could not be used to measure the effect of a single variable.

Related to the soil burial method is the soil suspension method *(2)*. The variables inherent in this method of test differ only slightly from the soil burial method inasmuch as the amount of soluble organic and inorganic constituents, as well as the microflora of the different soils from which the soil suspension is made, create such uncontrollable conditions as to be conducive to non-reproducible results, not only in different laboratories but also in repeated test at the same laboratory.

A technique (3) having a greater degree of control of the numerous variables inherent in the foregoing mildew-resistance test methods is accomplished by the use of controlled types of microorganisms and controlled formulations in the form of solid medium, generally agar, in which definite quantities of inorganic nutrients are dissolved. Agar is fundamentally organic in nature but has little available material that fungi can utilize for energy purposes. The agar method, therefore, approaches a means of providing controlled inorganic nutrients without the presence of organic matter capable of being attacked by fungi.

Probably the greatest factor against the use of agar culture techniques, however, aside from the slow diffusion of nutrients lies in the fact that most textile test strips curl during incubation, and, therefore, complete and uniform contact of the test strip with the agar is practically impossible to obtain. Growth over the test specimen will vary, in most cases, depending on the area of the test specimen in contact with the agar. This of course is an undesirable variable which is difficult to control. Even when complete contact of the test specimen is obtained, mildew growth can occur only on the aerobic surface (the surface not in contact with the agar) though either or both surfaces of a test fabric may be vulnerable to attack.

A technique which excludes even the remotest possibility of the presence of or-

ganic matter other than that included in the test specimen was introduced by Greathouse, *et al* (*4*). The technique involves the use of glass fibers to both support the test specimen and to act as a wick to transport inorganic nutrients. By this method inorganic nutrients were made available to the test specimen without contributing any organic matter whatsoever. Growth of fungi occurring in this assembly would positively indicate the test specimen was being attacked, inasmuch as the only possible energy source for the growth of fungi was the test specimen.

Even though the glass wick brought about a definite advance in a controlled mildew resistance test assembly, curling of the sample, with the attendant disadvantages, does occur. In addition, a constant source of viable spores necessary to insure reinfection throughout the entire incubation period is not provided.

The mildew resistance test method used by the Navy Department (*5*) approaches, indirectly, a means for a constant source of infection with viable spores growing on a piece of cotton sheeting placed over a solid glass support as a wick to supply nutrients to the test specimen. Because growth takes place on the cotton sheeting, in the presence of inorganic nutrients, a source of viable spores is provided adjacent to the test specimen, except when the fungicidal treatment on the test specimen leaches out sufficiently to prevent the growth of fungi even on the wick adjacent to the specimen itself. However, when this occurs it is not known for certain whether the spores failed to germinate because of leached fungicide or due to some other adverse physical conditions. At any rate this is a variable which does occur, and the condition of constant infection is not always fulfilled.

Other possibilities for errors in this method are as follows:

Growth, mainly aerial vegetative filaments, bridges from the cotton sheeting wick over onto the adjacent test specimen. This growth is, therefore, superfluous, but is often judged as evidence of mildew attack on the test specimen due to inferior fungicidal treatment. Soluble organic matter derived from the cotton wick, either before or during attack by fungi, flows over the test specimen where it then can act as an energy source for superficial mildew growth. This growth is thereupon mistaken for deficient mildew proofing treatment. As in the case of the Agar method (*3*), anaerobic conditions prevail in this latter method (*5*), on the surface in contact with the glass support, thus making conditions suitable for testing only one surface of the test specimen. This in reality is, therefore, only a partial test.

In methods (*2*), (*3*), (*4*), and (*5*), the pH of the nutrient medium approaches the region wherein bacterial contamination, which is quite common in routine testing using mixed culture technique, can destroy the reliability of the test.

Description of Material

The spore-rain technique is applicable to pure culture or mixed cultures of fungi. The present technique utilized a mixed inoculum, consisting of a mixture of spores of the following fungi: (1) *Aspirgillus niger,* (2) *Penicillium fusco glaucum,* (3) *Trichoderma viride,* (4) *Aspirgillus Clavatus,* (5) *Chaetomium globosum,* (6) *Myrothecium verrucaria and* (7) *Memnoniella echinata.*

The spores were collected from pure cultures grown on filter paper. An area of approximately one square centimeter of healthy characteristic - looking fruiting bodies of each fungus was placed together into one 180 ml. bacteriological dilution bottle containing approximately 50 ml. of sterile distilled water and approximately 75 grams of clean sterilized glass beads.

The spore mixture was then shaken for 3 minutes to insure liberation of the spores from the spore containing structures. The spore suspension was then filtered through 5 layers of sterile cheese cloth into a 100 ml centrifuge tube and centrifuged for twenty minutes at 2,000 R.P.M. The supernatant liquid was then decanted and the spores diluted with nutrient medium No. 1 to a volume giving between three and six deflections on the Klett colorimeter using a No. 42 Filter with the instrument zero-adjusted against distilled water.

The spore suspension was sprayed as a fine mist in inoculating the test specimen.

The size of the test specimen was a 1″x5¼″ strip that had been ravelled down from a 1¼″x5¼″ strip with the long dimension in the direction of the warp. In this experiment a No. 4 untreated cotton canvas in replicates of five was used.

The test chamber consisted of a Petri dish whose base measures 92 mm wide and 24 mm high, and whose top measures 100 mm wide and 20 mm high. (See Figure 1). The specimen support was a 2½″ square x ⅜″ thick piece of porous clay about which the test specimen was wrapped (See Figure 2). The top surface of the porous clay square was furrowed by five parallel lines ⅛″ deep x ¼″ wide (approx.), in order to provide aerobic conditions about the under surface of the test specimen so that all surfaces of the test specimen would be tested for mildew resistance in one exposure (See Figure 3).

The inorganic nutrient media used in this investigation was composed as follows:

Medium No. 1

NH_4NO_3	3.2 grams
KH_2PO_4	2.5 grams
$MgSO_4.7H_2O$	0.4 grams
$(NH_4)_2SO_4$	1.0 grams
$ZNSO_4.7H_2O$	0.005 grams
$MnSO_4.4H_2O$	0.005 grams
$FeSO_4.7H_2O$	0.005 grams
Distilled Water	1 liter

The nutrient medium was then adjusted to a pH of 3.5 with 4% H_3PO_4.

Medium No. 2

Nutrient Medium No. 2 is the same as nutrient Medium No. 1 but with 2.5% agar and 5.0% ground unbleached muslin added. Unbleached muslin cut to ¼″ lengths also were satisfactory.

Experimental Procedure

Before proceeding with the experiment all equipment, test fabric, and media were sterilized at 15 lbs. pressure for 20 minutes in a stream autoclave.

Three to five ml. of No. 2 nutrient medium were poured into the center of the inverted top portion of the Petri dish assembly. The test fabric was wrapped about the porous clay square with the long dimension perpendicular to the furrows, and placed into the bottom portion of the Petri dish assembly. The top of the Petri dish containing the Agar was placed over the bottom portion containing the test specimen.

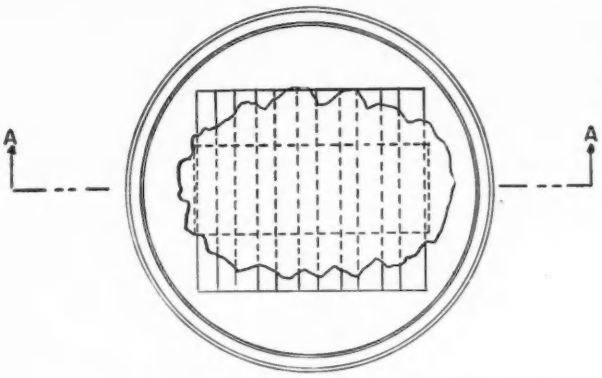
The test was then divided into two sets. In the first set the solidified agar medium on the underside of the top portion of the Petri dish, and the test fabric, were inoculated with the mixed spore suspension previously described. In the second set only the agar on the underside of the top portion of the Petri dish was inoculated, the rest of the assembly, including the test specimen, remaining sterile. In both sets 10 ml. of sterile inorganic nutrient medium No. 1 was placed into the bottom of each Petri dish assembly. The top portion was placed over the base of the Petri dish and the entire assembly was then incubated for 14 days at 85 degrees F. and 95% relative humidity.

Test Results

Growth of mildew over the agar on the underside of the top portion of the Petri dish in set No. 1 and set No. 2 occurred after the third to the fourth day. Both top and bottom surfaces of the test fabric in set No. 1 developed growth at this time also, inasmuch as they were inoculated at the same time as the Agar in the top portions of the Petri dishes.

The test fabric specimens in set No. 2, however, which were incubated in a sterile condition developed growth only after the sixth to the seventh day, the lapse of time indicating the spores were derived as rain from the overhanging fruiting bodies growing on the underside of the top portion of the Petri dish assembly.

Luxuriant growth developed in all por-



PLAN VIEW OF PETRI DISH ASSEMBLY

FIG 1

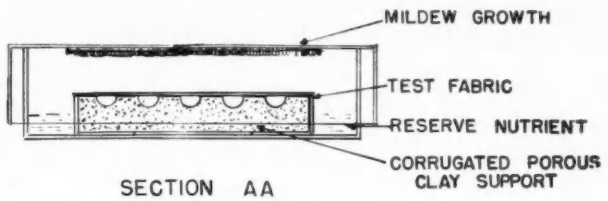


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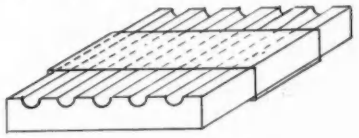
FIG. 2



DETAIL OF CORRUGATED POROUS CLAY SUPPORT.

FIG. 3

tions of set No. 1 and set No. 2 by the end of the fourteen day incubation period.

Quantitative tensile determinations with set No. 1 on the untreated test material was not necessary because the test fabric was completely disintegrated. Tensile results on set No. 2 were not performed inasmuch as this set was run only to show that the test fabric was capable of being inoculated automatically by the spores raining from the growths on the Agar suspended from the inside of the top portion of the Petri dish.

Discussion of Method and Test Results

The mixed culture of the organisms listed under Description of Materials included organisms generally associated with cellulose decomposition. The spores were filtered and centrifuged for the purpose of removing extraneous or soluble organic matter which might be transferred during the preparation of the inoculum.

The use of the Petri dish provides a simple incubation chamber which is easy to manipulate and requires only a small amount of storage space. The use of a corrugated porous clay support readily makes available inorganic nutrients from the bottom of the Petri dish to the test specimen by capillary action.

In addition, the corrugated surface of the porous clay support provides aerobic conditions on the underside of the test strip, enabling mildew growth to take place there as well as on the top surface of the test specimen. Probably a fritted Pyrex glass support would be more desirable than porous clay, if it could be obtained at reasonable cost.

The weight of the support also is useful in holding the ends of the test specimen firm so that curling does not occur.

Most commercial fungicide-treated materials are required to be water repellent. This treatment is usually incorporated with the fungicide in the coating compound. In any event, in order that the fungicide be effective under service conditions it must not be removed by water; the treated fabric must be water-proof. Because, under test, water cannot permeate these treated materials, the supports and wicks used in the foregoing methods (*3*), (*4*), (*5*) can transport or supply inorganic nutrients only to the surface of the test specimen immediately in contact with the wick where conditions are generally anaerobic and therefore not suitable for growth of mildew. These methods do not provide a supply of inorganic nutrients to the top surface of a water-proof specimen, even though the top surface is the only available area on which aerobic conditions for growth prevail in these latter techniques.

Therefore in order to insure the presence of inorganic nutrients on all surfaces, the method being presented utilized the technique wherein all test specimens were sprayed with the inoculating spores suspended in an inorganic nutrient medium. Thus the specimen was inoculated, and inorganic nutrients were supplied to all surfaces in one operation. After initial attack with rupture of the surface coating, additional nutrient can capillate through the specimen from the porous support.

Even with a material such as glue-glycerine bonded cork gasket which is rich in nutrients for fungi, the method of test should supply inorganic nutrients to all surfaces to insure against mechanical or chemical blockage by the fungicide of the nutrients inherent to the material. Failure to appreciate the need for supplying nutrients to all surfaces of material under test has compromised many test results in various laboratories.

The nutrient medium used in the experimental work involved in the development of the method being discussed was of a high nitrogen concentration which, as has been previously shown (*6*), is essential to good growth The ground muslin in nutrient medium #2 imbedded in the agar in the top portion of the Petri dish presented a substrate conducive to active mildew growth in the presence of necessary inorganic nutrients. It was desirable to control the acidity of the nutrient solutions in order to discourage the growth of bacteria if contamination occurs, which under alkaline conditions kill the fungus spores and create an uncontrolled variable. Lack of appreciation of the incidence and effect of bacterial contamination, with mixed culture work, has been the cause for many incorrect mildew resistance test results. Phosphoric acid was used because it gave better buffering action than any other combination of inorganic buffering substances tried. Mildew growth was not inhibited by the lowered pH condition of the nutrient medium.

Mildew growth on the underside of the top portion of the Petri dish was abundant after the third day of incubation with sporulation of different species evident. With the millions of spores produced conditions were favorable for a constant rain of spores onto the test specimen throughout the test period.

The ability of the mildew growths on the underside of the top portion of the Petri dish to supply a source of viable spores to the test specimen in the bottom portion of the Petri dish assembly was readily established from results of set No. 2, for even though the entire assembly, with the exception of the inoculated agar, had been incubated in a sterile condition, germination on the test specimen occurred in six to seven days, indicating the spores were derived as a rain

(*Concluded on Page* 675)

Some Experimental Work on the Dyeing of Viscose Rayon*

C. C. WILCOCK

THE purpose of this paper is to discuss a number of experimental results relating to the dyeing of rayons which were obtained in the Droylsden dyehouse laboratory between the years 1927 and 1945, and where possible to relate these results to subsequent alterations in large-scale processing. It is felt that the publication of these results will serve as a link to connect the various papers which have been published from the Droylsden laboratory.

Direct Cotton Dyes

In 1927 the problem of obtaining uniform dyeings on viscose rayons with variable affinity for dyes (light- and dark-dyeing viscose rayons) largely occupied the attention of both the rayon manufacturer and the rayon dyer. With the direct cotton dyes two lines of approach to the solution of this problem were followed at Droylsden, viz.—(1) The classification of these dyes according to their behavior on light- and dark-dyeing viscose rayons. (2) The search for dyeing methods whereby the differences in depth of shade on light- and dark-dyeing viscose rayons could be minimized or eliminated (i.e. correction methods).

As most of the results obtained by the first method of approach have already been published, they are merely summarized in this paper. On the other hand very little has been published regarding the second method of approach, mainly because one method only was found to be of limited practical use. Nevertheless, during the course of this work a number of observations of general interest were made regarding the behavior of direct cotton dyes.

Methods of Classification

In 1920, as a result of their work with viscose yarns of which the dyeing affinity had been deliberately varied, Wilson and Imison[1] published a list of direct cotton dyes classified as "even" and "uneven", while in 1925 Whittaker[2] provided a classified list of direct cotton dyes based on the extent of the capillary rise of their aqueous solutions on a viscose thread. By making this latter test under standard conditions it was found possible to attach to each dye a so-called "suction number" which enabled its even dyeing properties to be forecast; Chrysophenine G (even dyeing) had a suction number of 19, while Sky Blue FF (uneven dyeing) had a suction number of 9. (The term "uneven" refers to variation in shade between whole skeins of viscose rayon and not to patchiness on one and the same skein.) Practical experience not only confirmed Whittaker's observations, but also showed that those dyes with low suction numbers had the greatest tendency to give unlevel dyeings, i.e. patchiness on one and the same skein.

In 1927 it was pointed out[3] that those direct cotton dyes which give the most even results on light- and dark-dyeing viscose rayons (1) have a higher number as determined by the "suction test", (2) dye at a rapid rate, (3) show good levelling properties when equal weights of dyed and undyed viscose rayon are boiled together for 30 min. in a soap liquor, and (4) require the least addition of common salt to the dyeliquor.

The suction test was soon superseded by the "temperature range test"[4], which enabled a sharper classification of direct cotton dyes to be made. This test is based on the observation that those dyes showing maximum affinity for viscose rayon at 20° C. give the most even results on light- and dark-dyeing viscose rayons, while those dyes showing maximum affinity at 90° C. give the most uneven results.

Although the "temperature range test" shows that some dyes exhibit maximum affinity at 20° C., the rule that viscose rayon should be dyed at as high a temperature as circumstances permit holds good even with these dyes.

The "temperature range test" proved to be quite reliable until the introduction of certain direct cotton dyes which, although fatser to light, were, unfortunately, very uneven dyeing, when it was found that direct cotton dyes showing a maximum affinity at 90° C. exhibited wide variation in even dyeing properties which could not be predicted by this test. Further work culminated in a further empirical test[5] based on the behavior of 150/21 and 150/36 viscose rayons when dyed together. This test has one serious drawback as it depends upon a constant difference in the dyeing and optical behavior of the yarns, and, since different batches of yarn vary in dyeing properties, different results would be expected from different yarns, thus making the test unreliable.

In 1933 it was shown[6] that the even-dyeing dyes as a class are absorbed more rapidly to equilibrium than the uneven dyes. This observation enabled Boulton[7] to devise a test capable of drawing a much finer distinction between the direct cotton dyes than any of the previously published empirical methods. Briefly, the method consists of determining colorimetrically the quantity of common salt required to give a 50% dyebath exhaustion when dyeing is allowed to proceed to equilibrium. By means of a series of time dyeings with this amount of salt, the time required to give a 25% dyebath exhaustion is found. This value is known as the "time of half-dyeing", and is found to give widely different figures for different direct cotton dyes. Thus, Chlorazol Fast Orange AG (ICI) (uneven dyeing) has a time of half-dyeing of 155.5 min., while Chlorazol Fast Orange G (ICI) has a time of half-dyeing of 0.07 min. This method affords a most satisfactory means of classifying the direct cotton dyes as regards their behavior on light- and dark-dyeing viscose rayons. However, the problem is now much less accurate, owing to improvements in the uniformity of viscose rayon achieved by the rayon manufacturer.

Probably the most important outcome of the work summarized above was that the attention of dye-maker and dye-user alike became focused on the individuality of the direct cotton dyes.

In 1936 Whittaker[8] showed that careful control of the salt additions made to the dyeliquors is essential if satisfactory results with certain direct dyes are to be obtained in practice. He has also shown[9]

(Continued on Page 671)

* Presented at meeting, London Section, October 4, 1946, and Manchester Section, October 18, 1946, Society of Dyers and Colourists. Published in their Journal, May, 1947.

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Southeastern Section

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Student Chapters

Lowell Textile Institute
North Carolina State College
Philadelphia Textile Institute
New Bedford Textile Institute
Georgia School of Technology

Members should notify the Secretary immediately of all address changes

Olney Medal Awarded to Prof. Schwarz

THE Olney Medal for 1947 was awarded to Prof. Edward R. Schwarz, Head of the Textile Division at Massachusetts Institute of Technology, at presentation ceremonies held during the Banquet at the National Convention of AATCC in the Congress Hotel, Chicago, on October 25th. The Medal was presented by A. P. Howes, President of Howes Publishing Company, donors of the Medal. "Edward R. Schwarz—The Man" was discussed by Walter J. Hamburger of the Fabric Research Laboratories and Kenneth R. Fox, President of Lowell Textile Institute, spoke on "Edward R. Schwarz—The Scientist".

Prof. Schwarz

Prof. Schwarz is well known as a textile technologist, particularly for his contributions in the field of textile microscopy and textile testing. He was formerly vice-president of the Textile Research Institute. He is author of the book, "Textiles and the Microscope," co-author of the "American Cotton Handbook" and "Matthews Textile Fibers," and author of numerous scientific and technical papers on textile research. He graduated from MIT in 1923 and since has been a member of the instructing staff at the Institute. He has held his present position for the last 10 years.

Professor Schwarz is a Fellow of the British Textile Institute, and the American Association for the Advancement of Science. He is a member of AATCC, Textile Research Institute, American Association of Textile Technologists, American Institute of Physics, Optical Society of America, and the Scientific Advisory Board, Military Planning Division, Research and Development Branch, O.Q.M.G.

The Olney Medal was endowed by the Howes Publishing Company to encourage and to afford public recognition of outstanding achievement in, or contribution to, the field of textile chemistry and also as a testimonial to Dr. Louis A. Olney in recognition of his life-time of devotion and multitudinous contributions to this field. The Medal is awarded annually or at such longer intervals as the Committee on Award may elect. The award shall be made only by unanimous vote of the Committee. In the event that no unanimous agreement is reached, the award shall be passed for the year.

Previously Olney Medalists are: Dr. Louis A. Olney (1944), Dr. Milton Harris (1945) and William H. Cady (1946).

Complete details of the Presentation will be published later.

Prize Winners in Intersectional Contest

THE following prize winners in the Intersectional Contest were announced by Dr. Louis A. Olney, Chief Justice, at the Annual Banquet of the National Convention held at the Congress Hotel, Chicago, on October 25th:

First Prize: Northern New England Section: "An Electrolytic Method for Stripping Colored Wool." The committee was as follows: Kenneth R. Fox, Chairman; Edwin W. Adams, Tracy A. Adams, Lyman Billings, Henry D. Evans, Ernest R. Kaswell, Arthur C. Merrill, Jr., Clarence L. Nutting, Tom Peel, Dr. Donald H. Powers, Ridgley G. Shepherd, Thomas W. Shoesmith and Prof. John H. Skinkle. The speaker was Ernest R. Kaswell.

Second Prize: Philadelphia Section: "The Application of Chemical Controls to Acid Dyeing." The committee was as follows: Richard B. Stehle, Chairman; Curt R. Baeringer, Elmer C. Bertolet, Felice J. DeMaria, Harold L. DeTurck, Dr. Edwin C. Dreby, William Ebersold, Arthur W. Etchells, Walter F. Fancourt, Joseph E. Goodavage, Edwin J. Grajeck, Dr. O. B. Hager, Herbert C. Haller, M. H. Klein, Constantin J. Monego, Harry L. Morgan, Thomas J. Scanlon, Dr. Robert J. Thomas, Dr. Harold H. Tucker and Jackson A. Woodruff. The speaker was Richard B. Stehle.

Third Prize: New York Section: "Dyeing and Fastness Characteristics of Aqueous Chlorinated Wool." The committee was as follows: Daniel P. Knowland, Chairman; Dr. Alfred L. Peiker, Dr. Arthur E. Weber, Dr. Emery I. Valko, Dr. Hugo Ehrhardt, Charles H. A. Schmitt, James E. Flint, Edward D. Lind and William F. Brommelsiek. The speaker was Dr. Alfred L. Peiker.

Judges representing various sections were as follows: *New York Section:* Emmett J. Driscoll, *Rhode Island Section:* Elliott Broadbent, *Piedmont Section:* J. B. Neely, *Southeastern Section:* Curt Mueller, *Mid-West Section:* Joseph H. Jones, *South Central Section:* Alexander D. Campbell, *Philadelphia Section:* Prof. Percival Theel, *Northern New England Section:* Dr. David X. Klein.

The national committee for the Intersectional Contest was composed of the following members: Patrick J. Kennedy, Chairman; Winn W. Chase, J. Robert Bonnar, Frank J. O'Neil, C. Norris Rabold and Arthur T. Brainerd.

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1948 Convention To Be Held in South

THE 1948 National Convention will be sponsored by the Southern Sections of the Association. Present indications are that it will be held October 20-23 in Augusta, Georgia.

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Mid-West Research Committee

ALL sections have now formed Advisory Research Committees with the organization recently of such a Committee by the Mid-West Section. Members of this Committee are: Jerome Kritchevsky, chairman, Ninol Laboratories; Edward C. Eaton, Rit Products Corp.; Raymond K. Flege, North Star Woolen Mills Co.; Meyer Fleischmann, Real Silk Hosiery Mills; Arthur Hultberg, Bear Brand Hosiery Company; Leslie O. Meyer, Phoenix Dye Works, and Alfred J. Olson, Phoenix Hosiery Co.

Past and Future in Textiles from the Consumer's Point of View*

LEW HAHN

President, National Retail Dry Goods Association

I HAVE only the vaguest idea of what I can say to you tonight that would interest you. So I am going to fall back upon a device which, in the days when I used to go to church, I noticed the ministers always used. You know that dominies always talk to a text. They give you a text out of the Good Book, and you have to agree with that; as a result, you have to agree with most of what they say in the elaboration of that text.

In trying to think of a text that might fit an audience like this, I was lucky. I thought of two. I am going to repeat them to you, and then we will proceed from that point.

The first thing I want to say to you is to tell you of a definition which some wise man made many years ago. Perhaps you gentlemen who are chemists or in this industry, the technical trades, may be very familiar with it, but I think it is a gem. This man said, "Dirt is only matter out of place."

That means that that spot on your vest that you call dirt, really was just part of an egg that you ate on Monday morning. It was perfectly good matter. It was a good egg. But it is out of place, so it is dirt.

The second text which I would give you bears very directly on that, only I think it is positive instead of negative. I quote from a great book by Maurice Maeterlinck, the great Belgian poet and philosopher, his "Wisdom and Destiny," in which he said, "Surely, that man should be the most moral, should be of most worth in the world who best understands the place he should fill in the world."

Think of that. That is a sermon in itself.

I give you that because I think this great organization, represented by this audience, is a very clear indication that you men, in getting together, are in effect doing reverence to that very idea. You are in a calling in which you are useful. You are doing work which is interesting; you are serving other industries and, lastly, the great American public.

* Presented at Twenty-fifth Anniversary Meeting, New York Section, September 26, 1947.

Past Twenty-Five Years

I want to congratulate this organization upon this twenty-fifth anniversary. I can't pretend to be familiar with all of the tremendously interesting developments in your business, but it seems to me that twenty-five years of life of this organization parallels probably the most productive twenty-five year period in all the history of the textile industry, which goes back into antiquity.

I dare say that, even though the normal course of events has been interrupted for half a dozen years by a great war and the things which follow war, never in any twenty-five years that the textile industry have known from its very beginning have there been so many interesting, useful, valuable developments as there have been during this period.

I wish I were sufficiently familiar to do justice to the subject which I have introduced. I am not. I am a layman. I am neither a technical man nor am I a textile expert, but I have for many years been connected with a business which relies upon the textile industry.

Going back to the days of the first World War, I can remember the consternation which ruled in this country when we went to war with Germany, and we were cut off from the dyestuffs which we had been getting from the Germans. Whether the statement was accurate or not, I do not know, but I recall very well that the statement was made to me at that time that there was then not a single man in the United States who was capable of developing aniline dyes from coal tar.

I remember at that time that the department stores throughout the country, who had merchandise which had been subjected to dyes, blossomed forth with large tags on sweaters, on dresses, on coats, on everything you could think of, which said: "Because of war conditions we cannot guarantee the dyes." I think there was a more or less general opinion that perhaps if the thing continued very long, Americans would have to go back to the use of butternut juice and things of that kind if they desired any kind of coloring in their clothing.

Now we have just completed another great war, and in the years stretching between those two wars the dyestuffs industry in the United States has developed. So, this time, when we went to war, although we were cut off from the Germans again I heard not a word of dismay over the fact that there was any shortage of dyestuffs.

Developments in Textiles

When I think of some of the developments that have come in textiles during the last twenty-five years, I think it is a very significant record. Not only have dyestuffs been developed; they have been constantly improved. We also have such things as fabrics which can be treated so that they resist crushing and creasing; we have fabrics which repel water; we have fabrics which are flame retardent; and there have been the great synthetic developments. You know them better than I do—nylon, Vinyon, Fortisan, and things like that. There has been tremendous development and improvement of the rayons. I think you have a great deal to be proud of, because those things have been done by men like you, and they have been a tremendous benefit to the entire nation.

Then, I think, parallelling the development, the growth and the achievement of this organization, there has come a better realization of the need of proper testing methods. I rather think that prior to the time when your organization was started, attempts at tesing might very much have resembled some of those which, in the time of our grandmothers, consumers used to determine whether or not a piece of fabric was worthwhile. Then, of course, with the establishment of better testing methods, there have naturally come standards and, with the standards, fabrics have taken on qualities of real worth, qualities which has justified the makers in branding them with names that have meant something to the public.

I am one of those fellows who can't

think that any fellow who chooses to stick a fancy brand on a piece of cloth, or on a garment, or on a piece of merchandise of any kind is necessarily conferring any great boon upon the consumers; but I do think there is a tremendous value to consumers in brands which really mean something, which identify to the consumer those things upon which he can rely. Of course, those things have been possible in this field only through the development of testing methods so that you know what you are handing the public, and also by a rigid adherence to standards of real worth.

I think the things you have done are prophetic of the things that will be done. Therefore, I desire on this twenty-fifth anniversary to express my warmest congratulations to this industry. I hope you will go forward. I hope your organization will develop. I feel that progress has not stopped; but just as sure as the sun will rise tomorrow morning, so progress of industry and of the technical men who contribute to the development of that industry will be greater and greater as time goes on.

What Consumers Want

I have been asked, in talking to you, also to try to tell you what consumers want. I think I would be a very brash man indeed if I attempted to tell you what consumers want. I can't do it. I can tell you what we as retailers sense the public wants, and that won't be any surprise to you. The public wants more and better merchandise. The public wants that merchandise at more reasonable prices so that the standards of living of Americans can be constantly improved.

It has been the history of everything, I think, which has been developed by industry in this country thaat in the beginning things have been hard to make. Perhaps they have been only imperfectly made; and then gradually as time has gone on, each thing has been perfected so that constantly we have been handing to the public a better article, and the price has consistently come down. That has been the history with everything you can think of, from the automobile, through the washing machine, the refrigerator, the radio, and everything else that you choose to think of.

In the beginning, necessarily, prices have been high because we haven't had the know-how to make things, but, gradually, as skill has improved, as our technical knowledge has advanced, we have been in the position of constantly giving to the public better merchandise at lower prices.

I want you to know that the retailer, too, has played his part in that. I think we should all realize that if it were not for the fact that we have an established and highly efficient system of distribution, the economies and the improvements that are made in production would be worthless. Certainly, we can take shoes or anything you will. We can make them with three shifts throughout the factories, so that our machines are running all day long and all night long, and we can make them and make them, and pile them up until they reach the sky—and they won't do the consumer a bit of good.

The retailer has to add to them two very important utilities. They are the utilities of time and of place. That is our job in retailing. We do the job, and it has been done marvelously well in spite of the many slurs and many of the aspersions which have been placed upon the field of distribution.

I think, too, we should realize that one of the things from which retailers, unfortunately, suffer is the fact that we so glibly use percentages. We use percentages because they are convenient. The result is that you can hear men, sometimes economists, men who certainly should know better, stand up as I am standing before you tonight, and make statements like this: "In industry we find that great economies are being achieved, but the retailer still has to have his 40 per cent."

They never stop to think that 40 per cent can be a very variable thing when expressed in dollars. They never stop to think that when a thing has to be sold to the public for $10, and the retailer gets 40 per cent, that is $4. When, through the developments which are made in the factory, that thing can then be sold to the public for $5, and the retailer still gets 40 per cent, it is $2.

High Prices

So that for every economy which has been effected in production, distribution has made an equivalent contribution. Right now, we are up against a very serious situation. We have a time of high prices. We have on every side evidence of the fact that the public is greatly dissatisfied with the price level. Retailers find it more and more difficult to get the public to come and buy the merchandise at the prices which they must quote on it. That is witnessed by the fact that although our money volume increases, units are dropping steadily behind. The public is not buying as much merchandise as they must buy if industry is to be continued at a high pitch of activity. That is a danger signal which every retailer recognizes.

We have a committee of the Congress of the United States journeying about the country holding hearings in various cities to investigate the cause of high prices. It would almost seem as though that could be determined without any committee having to travel very far. I say this with no sense of political criticism: I don't know whether things would have been any better if the Republicans had been in power than when the Democrats were in power. So I say I am talking from the standpoint of economics and not at all from a political point of view.

However, I say to you that ever since 1933, every major act of the United States government has been inflationary in character. I haven't taken the time to dig out all the instances to support what I say, but I can give you enough so that you can follow them through yourself.

First, there was NRA. NRA expected to improve conditions by having the hours of work reduced and by raising wages, which was entirely commendable and desirable at that time; but it was a deliberate attempt to replace deflation with inflation. You can recall that in those days it was called reflation.

Then came the abandonment of the gold standard and the reduction of the gold content of the dollar to 59 cents.

So we went through the years, with every major act affecting our domestic economy, exerting all the inflationary influence that we could. Then, finally, it culminated in the greatest inflation-producing thing in all the world—a great war.

After having not merely driven with inflation for a great many years, but having actually opened our arms and invited inflation in, I don't see why we should be surprised that we have a considerable measure of inflation right now.

There are some peculiar things about inflation. If an inflation could touch every element in the economic system with equal weight, inflation wouldn't bother us at all. In other words, if prices and wages and the fixed incomes were all on the same level ,if they were in relationship, it wouldn't make a bit of difference whether they were all high or all low; but the trouble and the wails of distress come from the fact that inflation never does that. Some things are affected more quickly and more seriously than others.

You can take it as a general rule that prices, for example, are much more flexible than wages. Prices can change either up or down much faster than wages can. So, as inflation progresses, it falls with a special weight upon those who earn wages, and, of course, most heavily upon those who must supply their wants out of fixed incomes.

I think the situation is entirely understandable. I think the high prices have been caused not so much by greed, not so much by profiteering, although possibly ther has been some along the line, but by the fact that costs have increased; that prices necessarily must be based on costs, and naturally it means distress for a lot of folks.

That is the problem to which it seems to me every good mind in the United States should be applied. We are out on the firing line in the retail field. We meet the public. The manufacturers, whom you men in your various capacities serve, do not meet the public. So they get the reaction of the general public only in a secondary way. When the retailer finds that the public is resisting, that the public no longer feel that they freely can spend money as they did through that hectic, chaotic wartime, then the retailer can do nothing but report that condition to manufacturers, and hope that somehow throughout industry and throughout distribution it may be possible to make adjustments in price, so that consumers may freely buy again, so that we may have that volume of business which will insure steady work in the factory and continuous working of the wheels of industry.

We are about, I think, to have an attempt to reduce prices by way of jawbone exhortations. I don't know how successful that is going to be. I think all of us are sensitive to the condition. I venture to say this: I think there have been generally two different ways of making prices. One has been the method which has been used by practically all business during this war period and in the years succeeding up to this time, and that is, we take all our costs and we put them together. Then to that we add the desired margin of profit. Thus, arithmetically, we arrive at a price.

That is a very comfortable way to do things. I am sure everyone of us wishes that could be continued indefinitely; but, unfortunately, as I look back I can find only very few times in American business when it has been possible to do that. I think the way which we most generally have had to follow, in what we might call normal times, is that if we decide we are going to make something—it may be this glass, or this pitcher, or whatnot—we decide this thing is going to cost so much. We have to sell it then for such-and-such a price. Then we say, "But we can't sell many of them at that price. The public won't pay that price." So we say, "If we can get that down to such-and-such a price, we can get the maximum of volume from it."

So we take a chance. We go ahead and we make the thing. We offer it at the price which our judgment tell us will most successfully sell it. Then when we find that our costs are too high to allow us a profit, we just turn in and then we work like hell to get our costs down. I think that is the normal course for business.

However, I want to say this: Unfortunately, never in my recollection have we had an economy which is quite as rigid as this is. There was a time when business was faced with a difficult period, when a man could go to his workers and explain his situation, and say, "Now, unless we can get the cost down to so-and-so, we will have to suspend, and you fellows will be out of jobs." The workers have been willing to kick in and produce as they had not produced before; and by such means we have managed to get the costs down. That is a very difficult thing to do today, because the labor unions have grown enormously in power. Their constant philosophy seems to be one of restricting production. You are no longer in a position where you can go to your workers and explain the necessity for increased production to reduce costs and get it. So that I don't know when we will ever be able to get back on what used to be our normal procedure. That is a tremendously important thing, in my opinion.

Supply and Demand

I am seriously afraid that although we see on every side evidence of rising costs, I believe manufacturers are quite sincere when they say that on the basis of their present costs they can't get prices down; that, as a matter of fact, prices are likely to advance. Nevertheless, as I look ahead, I am apprehensive. I feel that there are two elements which must be considered. They are very familiar elements: supply and demand.

I think it is natural for men who are in the productive industries to think largely in terms of supply. The retailer is likely to think more in terms of demand. If we can increase our supply of merchandise, if we can increase productivity, if, in place of things which are still scarce, we can bring an abundant supply of goods, there can't be any question but that prices will drop. We can't do that at the moment.

However, I call to your attention that there is another way of balancing supply and demand, and that is, through a reduction of demand even if supply has not increased. I don't suppose there is a business man in this country who, in the face of a tremendous drop in the demand for his goods, wouldn't cut the price no matter what his costs have been. Certainly, that is the way with retailers. The retailer has to do business. When he finds that at the prices at which his goods are marked the public is not buying, regardless of what he paid for the goods, he cuts the prices to a point where they will buy.

We can feel a sense of security because of the economic condition; we can talk about the large amount of exports that are being sent to the war stricken nations of the world; we can talk about the high costs rising from a non-productive labor supply and high wages, and all that sort of thing; we can prove to ourselves that we are nowhere near anything like a price break. However, if all this agitation, if the publicity which is being given throughout the nation to high prices, if the things which President Truman apparently is getting ready to pour forth—exhortations for lower prices, and all that sort of thing—should have the effect, as it very well could, of disturbing the public still further and causing people to withhold from buying things which normally they would buy, then I venture to suggest that we will have a price break in spite of all the other conditions.

I think there is one thought I wish to leave with you more than any other. It is the sense of the interdependability of all the people in the United States, the responsibility of each one, the obligation to do what he can to make sure that we do not have the conditions in which Communism and all sorts of subversive isms will flourish.

There is a greater thing at stake in that than profits. There is a greater thing than any of us can contemplate. I think we must be all assured by this time that there are many, many people just waiting for something like a depression or a panic to come upon this nation to overturn the things which we love and which we really should feel dearer than life itself.

If we face those things as we faced the war, with each man determined to do his part, with each man trying to live up to his full responsibility, I don't think there can be any doubt of the outcome.

Complete Details regarding the Chicago Convention will be published in the near future

Summary of Report on
Accelerated Ageing of Cotton Textiles

(Original report prepared by Julian Maas, Chemist, Development Department, Naval Clothing Depot, Brooklyn, New York.)

THIS report is a resume of work along the line of so-called accelerated ageing being carried on at Government and other agencies and contains information based on observations by the writer on visits to these agencies. The report does not attempt to be a comprehensive exposition of the total work carried on in the field.

Effort is being made by several agencies to attack the problem of accelerated ageing from different angles, in order that the separate findings may all contribute to the solution.

Two general schemes are being followed: (1) A study of chemical breakdown of cellulose fibers; (2) Observation and analysis of actual weathering data, comprising (a) exposure tests made at differnt stations, and (b) a study of the various influences which go to make up the broad term "weather".

A bibliography relating to the effects of light and weathering has been compiled by the National Research Council, with references cited pertaining to the two schemes previously mentioned—chemical breakdown and actual weathering.

The following observations were made of the work being conducted at the various institutions visited:

Quartermaster Corps, U. S. Army:

At Camp Lee, Virginia, extensive weather exposure tests of tentage fabrics have been made. Cooperation in measuring solar radiation has been given by the Smithsonian Institution, and in securing fluidity and breaking strength data by the Harris Research Laboratories, the latter also carrying out a study of the deterioration of fabric in contact with metals such as the grommets used in tents. A report (*1*) issued contains voluminous observations of solar radiation measurements, but is not yet complete with fluidity and breaking strength results. Another report (*2*) by the Quartermaster Corps pertains to exposures at Homestead, Florida, Fort Sherman, Canal Zone, and Barro Colorado, Canal Zone.

Another report (*3*) outlines the research to be followed by the Office of the Quartermaster General under the direction of Dr. S. J. Kennedy. Among other things, consideration is being given to weather exposure of fabrics in various locations, including Montezuma, Chile, a station at which there is intense solar radiation with low humidity.

At the Philadelphia Quartermaster Depot Laboratories a study is being made of the manner in which the cellulose chain is broken down through the action of various oxidizing or hydrolyzing agents. Attention is also being given to the influence of dyes on cellulose structure. Work along these lines has been described in a report (*4*), prepared by the Research and Development Division, which also includes methods of preparing cellulose by desizing and depectinizing, as well as details for making fluidity determinations.

National Bureau of Standards:

The National Bureau of Standards has made weather exposure tests of duck, osnaburg, and balloon cloth, treated and untreated, at Washington, in Maryland, and at Yuma, Arizona. Some of the results of these tests were presented in a report to the AATCC Research Sub-committee on Ageing of Textiles (*5*).

Studies in connection with accelerated ageing that are being carried on at the National Bureau of Standards include an examination of the degrading effects on textiles of ozone, moisture, and light. It is desired to determine whether the very small amount of ozone normally present in the atmosphere (1 to 10 parts per one hundred million) may be an appreciable factor in degrading exposed fabric. A study is to be made of the effect of moisture on weather exposed fabrics, including the apparent changes that take place at a cellulose-air-water interface. Extensive work is also being carried on to develop a weathering machine in which exposure conditions can be closely controlled and which will be useful in calibrating commercial weathering units now employed in industry. The infra red spectrophotometer is being used as a possible new tool for analysis of fabric. Use is also being made of the electron microscope to determine how deterioration may affect the surface of the fabric.

Southern Regional Research Laboratory:

Although the Southern Regional Research Laboratory has at present no project dealing specifically with accelerated ageing, a considerable amount of work in this field is being done under a project that is concerned with the protection of cotton fabrics against the attack of weather and of microorganisms. During the past 5 or 6 years weather exposure tests have been made of gray and of commercially purified cotton fabrics, and the degradation caused in these fabrics by the action of weather measured by determining the changes that occurred in their strength and fluidity. By averaging data secured from the exposure of replicate samples, typical weathering patterns have been established to serve as standards of reference in weather exposure and ageing work (*6*).

A special normal incidence solar radiation cabinet (*7*) which has fairly closely controlled conditions of air-purity, temperature, and relative humidity is being utilized to study the destructive action of pure sunlight on gray and bleached, treated and untreated, cotton fabrics.

In the laboratory a standard accelerated weathering unit has been modified to permit the irradiation of samples by light from a carbon arc source under conditions of temperature and atmospheric moisture that approach more closely to natural weather exposure than is possible with the unaltered machine. Although the degradation that occurs in cotton samples exposed in the modified unit differs in some respects from the results of exposure to natural weather, it is hoped that the instrument can eventually be employed with some assurance to determine the ultraviolet screening effects of various protective treatments.

Navy Department:

The Bureau of Ships some years ago conducted exposure tests of treated canvas at the Brooklyn Navy Yard, at Philadelphia, at Coral Gables, Florida, and in the Canal Zone. Data have been obtained

and a formula derived for a laboratory test as related to outdoor weathering. A report pertaining to this investigation has been issued (*8*).

Work on weathering conducted at the Naval Clothing Depot, Brooklyn, is intended to contribute to the general program of prevention of deterioration and is of direct interest to the Navy insofar as it relates to rainwear, tarpaulins and life preservers. Consideration has heretofore been given to the influence of various factors of the weather as related to bleached twill. Exposures of fabric samples have been made at Brooklyn, New York, and at Clearfield, Utah, for periods of from 1 to 12 months, and tests have been made for fluidity and breaking strength in many of these weathered samples. Results have been detailed in the full report (9) of which this is a resumé.

It was found that while a rough correlation existed between hours of exposure to sunlight and rise in fluidity certain exceptions occurred. It was pointed out that this may have been due to changes of 10° or more in temperature which occur during the exposure. Consideration was given to the influence of soot and smoke collected on the samples—such surface deposit probably exerting a protective effect, inhibiting ultraviolet deterioration.

An apparent effect was the noticeable difference in the generally lower fluidity of the samples exposed at Clearfield than those at Brooklyn, which may have been due to atmospheric pollution at the latter place. This acid contamination of the air, furthermore, seemed to exert an influence after removal from weather exposure and it is therefore suspected that the samples exposed at Brooklyn continued to degrade significantly during storage.

The proposed future investigations at the Brooklyn Naval Clothing Depot will be directed toward learning if the contamination in the air is an important factor in the deterioration of cotton fabric and to find if it has an effect on storage. Samples are to be exposed in a manner that will subject some to the free action of sunlight, others to the action of rain and others to the action of atmospheric moisture, sunlight being excluded under special exposure conditions employed in the last 2 cases.

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(3) Kennedy, S. J., Wells, R. D., and Backer, S. Areas of Quartermaster research in textiles. Off. Quartermaster General, Military Planning Div., Research and Dev. Br. Textile Ser. Rept. No. 25. Released for public information by Off. Pub. Bd., U. S. Dept. Commerce, 1946.

(4) Philadelphia Quartermaster Depot Bi-Monthly Rept. May 1947.

(5) Barnard, K. H., Chairman. Report of Committe on Ageing of Cotton Fabrics. 1946 Year Book A.A.T.C.C. *23*, 135-6.

(6) Dean, J. D., and Worner, R. K. The degradation of untreated cotton fabrics exposed to weather in a sub-tropical climate. Am. Dyestuff Reptr. *36*, 405-10, 423-4 (1947).

(7) Fynn, P. J., and Campbell, K. S. Automatic, normal-incidence solar exposure cabinet. Textile Research J. *17*, 158-66 (1947).

(8) Bureau of Ships, Industrial Testing Laboratory, Navy Yard (Brooklyn). Rept. No. N 6007.

(9) Naval Clothing Depot (Brooklyn). Report on accelerated ageing of cotton textiles. May 1947.

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Meeting, Lowell Textile Institute Student Chapter

THE first business meeting of this school year was held by the Lowell Textile Institute Student Chapter of the AATCC on October 2, 1947.

Chairman Albert L. Bianco called the meeting to order and the minutes of last year's final meeting were read and accepted.

Mr. Bianco then announced the following appointments to committees:

Membership chairman, Albert G. Hoyle

Publicity chairman, Allen Frank

Program chairman, George D. Kenniston

By-laws chairman, Stuart E. Penner

Reports by Mr. Kenniston and Mr. Hoyle were accepted.

The first business to confront the chapter was the selection of a Faculty Advisor. Ernest P. James, who served as Faculty Advisory last year, was re-elected by a wide margin.

Chairman Bianco then requested suggestions for the type of program to be presented by the Student Chapter. Last year several guest lecturers from various phases of the industry were presented at Lowell Textile Institute by the Student Chapter. A suggestion that we present a seminar type of program was offered and, after a brief discussion of the relative merits of the seminar and the lecture types of programs, a motion was made and carried that the programs be of the seminar type to be held in the evening once a month on a day to be arranged by the program committee.

The next business before the Student Chapter was the selection of the most convenient time for regular monthly meetings. Tuesday of the first week of each month was accepted as the most convenient meeting day. The meeting was then adjourned.

Respectfully submitted,

L. C. GARDNER, *Secretary*

Membership Applications

ASSOCIATE

Charles J. Monks, Jr.—Salesman, Royce Chemical Co., Carlton Hill, N. J.

Angus H. Roberts—Chemist & Colorist, California Hand Prints, Inc., Hermosa Beach, Calif.

Gilmore Rudnik—Treas. & Mgr., Berkshire Textile Corp., Adams, Mass.

Albert F. Turbitt—Vice President & Treas., Turbitt-Lefebvre, Inc., New York, N. Y.

Francis J. Connolly—Purchasing Agent & Secretary, Morgan Dyeing & Bleaching Co., Rochelle, Illinois.

Robert S. Dempsey—Monsanto Chemical Co., New York, N. Y.

Mihran A. Kabakian—Proprietor & Director, "Mihrtex" Factory for Text. Printing, Beirut, Lebanon.

Warren S. Kumblad—Sales Engineer, Process Products, Socony Vacuum Oil Co., Inc., Cambridge, Mass.

Charles Z. Sajovic—Manager, Dyestuff Department, Robert and Co., New York. N .Y.

James H. Snowden—Secretary-Treasurer, Robert and Co., New York, N. Y.

William F. Van Deven—State Representative, Procter & Gamble Distributing Co., Cincinnati, Ohio.

Charles K. Wall—Sales Representative. Kelco Co., New York, N. Y.

Harry D. Purdy—Vice President in Chg. of Production, The Tuttle Press Co., Appleton, Wis.

STUDENT

Mario S. Lyra—Lowell Textile Institute Sponsor: E. E. Fickett.

Isaac N. Bunce—Georgia School of Technology. Sponsor: C. A. Jones.

Robert A. Harden, Jr.—Georgia School of Technology. Sponsor: C. A. Jones.

L. T. Reagor—Georgia School of Technology. Sponsor: C. A. Jones.

Hugo E. Scheuer—Georgia School of Technology. Sponsor: C. A. Jones.

James R. Slaton—Georgia School of Technology. Sponsor. C. A. Jones.

Robert B. Watkins—Georgia School of Technology. Sponsor: C. A. Jones.

Daniel A. Winterbottom—Georgia School of Technology. Sponsor: C. A. Jones.

C. P. Yih—Georgia School of Technology. Sponsor: C. A. Jones.

EMPLOYMENT REGISTER

All correspondence regarding the Employment Register should be sent to the National Secretary.

Group Attending Banquet at Fall Outing of South Central Section

Head Table at South Central Banquet

Fall Outing, South Central Section

THE Fall Outing of the South Central Section was held at the Lookout Mountain Hotel on top of Lookout Mountain, September 5th and 6th.

The program for men included golf Friday afternoon at the Fairyland Golf Club and Saturday morning at the Meadow Lake Golf Club; horseshoe pitching Saturday afternoon and bridge Saturday afternoon, also swimming and sightseeing.

The program for the ladies consisted of swimming and sightseeing Friday afternoon, games Saturday morning and bridge Saturday afternoon.

The banquet was held in the main dining room of the hotel Saturday night. Entertainment included orchestra and floor show. Dr. Harold W. Stiegler, Director of Research for the Association, gave a talk on the research program and aims, indicating that more research projects would be placed in Southern laboratories. Charles Noone, prominent Chattanooga lawyer and businessman, gave an enlightening talk on Government extravagance and how to combat it.

Fletcher Kibler, Chairman of the Outing, awarded the prizes. There were twenty prizes for golf, sixteen for bridge, two for horseshoe pitching and twenty other prizes. A dance followed the banquet.

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Membership Applications

SENIOR

George J. Bogorad—Secretary-Treasurer, Seaboard Industries, Paterson, N. J. Sponsors: J. J. Bloetjes, S. J. Ciongoli.

Arthur A. Coleman—Salesman-Technician, Ciba Co. Inc., Chicago, Ill. Sponsors: A. T. Brainerd, W. Boyd, Jr.

John F. Lathrop—Chemist & Dyer, Paul C. Whitin Mfg. Co., Northbridge, Mass. Sponsors: E. W. Birdsall, M. J. Lane.

Eleanor B. Cook—Asst. Editor of Household Equipment, McCall's Magazine, New York, N. Y. Sponsors: P. B. Mack, S. Davison.

Harold J. Reichert—Supt. of Finishing, Morganton Full Fashioned Hosiery Co., Morganton, N. C. Sponsors: H. A. Walker, W. A. Daniel.

Louis S. Szabo—Plant Supt., California Hand Prints, Manhattan Beach, Calif. Sponsors: T. B. Smock, Jr., A. H. Roberts.

JUNIOR

Phyllis J. Atkinson—Lab. Technician, Calco Chem. Div., American Cyanamid Co., Bound Brook, N. J. Sponsors: H. E. Millson, S. Mooradian.

Robert R. Blank—Asst. Dyer, Morgan Dyeing & Bleaching Co., Rochelle, Ill. Sponsors: K. M. Harmes, L. E. Blank.

Estelle C. Leblanc—Chemist, Massachusetts Mohair Plush Co., Lowell, Mass. Sponsors: D. E. Ray, A. H. Grondin.

ASSOCIATE

John H. Brower—Resident Purchasing Agent, Indian Spinning & Weaving Companies, San Francisco, Calif.

H. L. Ettman—Vice President, A. S. Aloe Co., St. Louis, Mo.

Eduardo Guzman—Chief Chemist, Compania Manufacturera Covadonga, S. A., Municipio De Puebla.

John F. Leonard—Chemist, Eddystone Mfg. Co., Eddystone, Pa.

Frederic P. Robert—President, Robert & Co., Inc., New York City.

Rolf E. Schneider—Patent Lawyer, Interchemical Corporation, New York, N. Y.

STUDENT

Dennis W. Bruce—Lowell Textile Institute. Sponsor: E. E. Fickett.

Nathaniel A. Matlin—Lowell Textile Institute. Sponsor: E. E. Fickett.

APPLICATIONS FOR TRANSFER TO SENIOR MEMBERSHIP

Walter Akam, Mark N. Curgan, John A. Harley, Ernest P. James, Ridgley G. Shepherd, Jr.

EMPLOYMENT REGISTER

This column is open for four insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information from the Secretary.

47-36

Education: University graduate.

Experience: Consumer relations and textile laboratory management.

Age, 37; single; references; will consider any location.

47-37

Education: Lowell Textile Evening School.

Experience: Dyer, variety of fibers, asst. foreman.

Age, 30; married; references.

47-38

Education: S.B., Lowell Textile Institute, 1947.

Experience: Laboratory asst. and kettle hand.

Age, 22; single; references.

CALENDAR

PHILADELPHIA SECTION
Meetings: January 9, 1948, February 27, April 9, May 14 (Kugler's, Philadelphia).

NORTHERN NEW ENGLAND SECTION
Meeting: November 21.

NEW YORK SECTION
Meeting: December 5 (Swiss Chalet, Rochelle Park, N. J.).

SOUTHEASTERN SECTION
Meeting: December 6 (Atlanta, Ga.).

ABSTRACTS
FROM CONTEMPORARY JOURNALS

Vat and Azoic Colors Preferred for Printing

Arthur K. Saville, Textile World, page 122, Vol. 97, No. 8, August, 1947.

Consumer "color-consciousness" demands the use of faster colors in the dyeing and printing trade resulting in an increased use of vat, azoic, and soluble vat colors. The application of these colors requires careful preparation of fabric and print paste and close attention to details of application.

The cloth preparation consists of those treatments which will result in the material having maximum absorbency and purity to insure complete utilization of the dyestuff with respect to clarity and brilliance.

The gums and thickeners in print pastes act as color carriers as well as mediums which produce dyeing conditions while preventing mark-off or flushing. The most widely used thickeners are wheat and corn starch, British gum, and prepared textile gums, the latter being mixtures of natural gums and starches which are solubilized.

The azoic colors are of two types: (1) bases and stabilized diazo salts used on cloth containing the coupling component and (2) the "Diagen" and "Rapidogen" colors which are mixtures of stabilized bases and naphthol coupling components. The preparation and application of these colors is discussed.

Vat colors are characteristically fast to light, washing, acids, alkalies and bleaching which indicate their use for such materials as shirtings and draperies. The addition of hydroscopic agents to vat color pastes has prevented freezing and drying out and subsequently eliminated damage to stored pastes. A general method for the application of vat colors is given. Thickeners and after-treatment procedures for use with vat colors are included.

Effect of Alternate Heating and Cooling on the Breaking Strength and Elongation of Cotton and Rayon Tire Cords

Walter S. Lewis, Textile Research Journal, page 431, Vol. XVII, No. 8, August, 1947.

An investigation was made to determine the effect of alternate heating and cooling upon the strength and elongation of cotton and rayon tire cords. Three cotton and three rayon cords were used in the study. Measurements were made under standard atmospheric and oven-dry conditions with the test procedure in accordance with the standards of the American Society for Testing Materials. The cyclic heating and cooling consisted of heating at 265° F. for 16 hours and 8 hours at standard atmosphere. Tests were made after 1, 24, 36 and 48 cycles.

Variations in tenacity loss were noted for the different cords after each series of cycles as well as under the two conditions of tests. A mercerized cotton cord showed the least percentage loss in tenacity and was followed by one of the rayon cords. The two unmercerized cotton cords were more resistant than two of the rayon cords when tested by the standard method. However, the reverse order was noted in the oven-dry state.

Initial elongation of the rayon cords was higher than that of the cottons; however the elongation of the rayon reduced with increasing cycles.

The cyclic heating and cooling materially reduced the moisture regain of all the cords but with slightly less effect upon rayon.

Test data is included by means of several curves and tables.

Hydrolysis of Native Versus Regenerated Cellulose Structures

O. A. Battista and S. Coppick, Textile Research Journal, page 419, Vol. XVII, No. 8, August, 1947.

This paper is summarized as follows:

The cellulose accessibility of native and regenerated cellulose was measured using milder conditions of hydrolysis than previously reported. It is assumed that, under less severe hydrolytic conditions, the accessibility of the fine cellulosic structure is related to the rate of change of the average degree of polymerization with time of treatment.

The following samples with their respective treatments were used in this study. In each case 5 N HCl at 18° C. was used for the hydrolysis.

1. Cotton linters pulp and acid-degraded cotton linters pulp before and after solution and regeneration.

2. Cotton linters and acid-degraded cotton linters before and after swelling in 18 percent NaOH for 2 hours.

3. Viscose rayons made from cotton linters and acid-degraded cotton linters.

It is concluded that the process of solution and regeneration without degradation considerably increases the hydrolytic accessibility of the fine structure of a native cellulose. Swelling in 18 percent NaOH also increases the hydrolytic accessibility.

The experimental procedure used as well as test results in both curve and tabular form are included.

One-Bath Method of Dyeing Acetate Developed Black

L. S. Thompson, Rayon Textile Monthly, page 111, Vol. XXVIII, No. 9, September, 1947.

The following method is suggested whereby developed acetate blacks may be applied to all-acetate knit or piece goods in one bath within approximately 5 hours.

6% Cellitazol 3GNF Extra Soluble or 6% Cellitazol BNF Extra Soluble.

4% Plutoform Black CAM or 4% Phenamine Black BD.

The dye is dispersed or dissolved as usual and added to the dyebath at 130° F; the temperature is raised to 190-200° F. and run for 45 minutes. The steam is then shut off, 3% Developer ONS added and run for another 45 minutes. If the temperature has not dropped to 120° F. by then cold water may be added. Diazotizing and developing are carried out simultaneously in the original dyebath by adding 4 to 8% hydrochloric acid, 20° Bé, at which point the bath should have a pH of 2.5 The goods are run for 15 minutes, 6 to 8% sodium nitrite then added and developing continued for 20 minutes. The bath is flushed clear and goods are aftertreated with ½% Igepon T Gel and 2% hydrosulfite for 10 minutes at 160° F. For acetate-viscose mixtures use ½% Igepon T Gel for 15 minutes at 140° F.

Nylon may be dyed in the same manner increasing the amount of Cellitazol to 7-8% and carry out the diazotizing with 10% hydrochloric acid, 20° Bé, and 10-12% sodium nitrite. Aftertreatment is the same as for all acetate material.

Perspiration Effects on Fabrics

Louis C. Barail, Rayon Textile Monthly, page 112, Vol. XXVIII, No. 9, September, 1947.

Fresh perspiration has a pH of about 4.5 and has little action on fabrics. It does have an adverse effect on certain dyes and finishes and reduces the potency and ef-

ficiency of germicides and fungicides having a high pH. Bacterial decomposition causes the pH to gradually increase until it finally becomes alkaline. The alkaline perspiration causes much more damage, reducing the tensile strength of all animal or vegetable fibers, both because of its alkalinity and bacterial action. The amount of damage is increased when the pH becomes higher, when the number of contacts is greater, when the moisture is greater, and when alkaline cleansing agents are used. The contaminated perspiration causes dyes to bleed, fade and stain and the bacteria present feed on a great number of finishes.

Perspiration effects can be prevented by reducing the amount of perspiration and by treating the fabrics. Anti-perspirants do not completely eliminate perspiration and they may contain substances that have their own damaging effect on fabrics. Fabrics may be given a semi-permanent processing with dilute solutions of strong germicides-fungicides which will protect the fabrics for several months. There is a further discussion of germicides-fungicides, treatment outside the mill, use of germicidal soaps and testing procedures.

The Chemistry of Some Plant Gums and Mucilages

E. L. Hirst and J. K. N. Jones, Journal of the Society of Dyers and Colourists, page 249, Vol. 63, No. 8, August, 1947.

An account is given of the chemistry of a few examples of plant gums, mucilages, and pectic materials and shows the general type of structure present in these closely related substances. Cellulose, alginic acid and pectic acid, although derived from sugars of different configurations, have similar geometric arrangements in their structural formulas and the results of x-ray investigations show an important generalization regarding the geometrical shape of the sugar rings in these fiber producing molecules. In the formation of gums and mucilages the plant sugars must be broken down. The gummy properties of these polysaccharides seem to be dependent upon the gum's solubility in water.

Studies in Viscose Rayon Dyeing: Applications of the Dyeometer

G. L. Royer, H. R. McCleary and J. M. A deBruyne, Journal of the Society of Dyers and Colourists, page 254, Vol. 63, No. 8, August, 1947.

The effects of rayon manufacturing variations and variations in dyeing conditions on the dyeing of viscose rayon were studied.

Manufacturing variations discussed are: effect of filament denier, effect of spinning stretch, effect of viscose age, effect of skin, effect of degree of polymerization, effect of delusteran:s and dyeing of inflated yarn.

Variations in dyeing procedure discussed are: effect of sodium chloride concentration, effect of various salts, effect of yarn weight, effect of temperature, and effect of dye concentration.

The Dyeometer, which is useful for making accurate measurements of exhaustion at all stages of a dyeing, was employed to obtain the dyeing data.

Some Chemical Aspects of the Application of Velan PF to Cotton Fabrics

F. V. Davis, Journal of the Society of Dyers and Colourists, page 260, Vol. 63, No. 8, August, 1947.

Velan PF consists of approximately 38% sodium chloride and 62% essentially pure stearamido-methyl pyridinium chloride; the latter compound (SAMPC) breaks down on hydrolysis to stearic methylolamide and pyridine hydrochloride. On cotton part of the methylolamide condenses with the cellulose at curing temperature to form a $>CH.O.CH_2$—link, but the amount which condenses shows little tendency to exceed 1-2%. When more than 2% of SAMPC is applied to cotton, the excess appears to undergo condensation to the dimeric ether of stearic methylolamide, and part of the latter to lose formaldehyde and yield disteramidomethane, which is itself water-repellent. The SAMPC which is not chemically bound to the cellulose as an ether is removable by extraction with boiling benzene-methanol or chloroform. The final breakdown of products resulting from the hydrolysis of SAMPC are pyridine hydrochloride, formaldehyde, ammonia and stearic acid. To estimate the Velan PF applied to cotton, the preferred method consists of hydrolysis with 5% sulfuric acid and steam-distillation, and determination of the formaldehyde in the distillate. It is indicated that considerably more work is needed to make the study comprehensive.

Colour and Constitution: The Absorption of Light by Chemical Compounds

(The Fourth John Mercer Lecture)

E. J. Bowen, Journal of the Society of Dyers and Colourists, page 281, Vol. 63, No. 9, September, 1947.

The interaction of chemical and physical concepts has produced a new set of ideas which are of great value, even if their use at present is largely qualitative. According to present-day concepts the laws of light absorption are provided by the equations of wave-mechanics. A number of examples are given.

The Application of Microscopy to the Textile Field

G. L. Royer and C. Maresh, Journal of the Society of Dyers and Colourists, page 287, Vol. 63 No. 9, September, 1947, Textile Research Journal, page 477, Vol. XVII, No. 9, September 1947.

The use of the microscope is considered in a number of applications including: fiber identification and determination of fiber size, fineness or denier and quality; determination of efficiency of retting of bast fibers, of degree of degumming and presence of weighting materials in silk, of location and amount of wool grease present, of changes in physical appearance of wool fibers, of peneration and distribution of dyes; study of the particle size and state of dispersion of vat dyes and the condition of the starch in thickener in printing; investigation and identification of various finishes; determination of physical properties. There is also a discussion of new instruments, fluorescence microscopy, optical staining and photography.

A Dynamic Absorption Method for Determining Water-Repellency

J. E. Simpson and Ruth M. Howorth, Textile Research Journal, page 497, Vol. XVII, No. 9, September, 1947.

This article reviews the most commonly known methods of testing water-resistance and reports development of a Dynamic Water-Absorption Method. It is concluded that this method is believed to be the most precise yet developed for:

"Determining the maximum hydrophobic level which any particular water-repellent is capable of producing on a fabric.

"Determining the true degree of hydrophobicity of a fabric at any time (when new, after wear, after any cleaning operation, or after any other treatment).

"Ascertaining the efficiency of application of a repellent finish (application factors may include uniformity of penetration, distribution of a finish through the fabric, proper curing, etc.)

"Quickly indicating the protective qualities of a finish during any given use period until the repellency may be changed by wear."

It is acknowledged that although the method may be used for evaluating finishes applied to resilient fabrics, the method of removing excess water by pressure puts limitations upon its usefulness for such fabrics.

• PATENT DIGEST •

PAUL WENGRAF

Permanent Finishes—Cellulose ethers; non coherent film. G, 2, 01

U. S. Pat. 2,422,572-73
(Lilienfeld Patent Corp., Lilienfeld, June 12, 1947)

The inventor, known for his research work done in the field of rayon and of cellulose ethers, explains in the introduction to these patents that many inventions of his own (going back to U. S. Pat. 1,589,606) described different methods for producing permanent finishes on vegetable fiber material. The general rule was to dissolve the alkali soluble (but water or acid insoluble) product in alkalies, to impregnate a fabric therewith and to precipitate the film on the fiber by appropriate neutralization. It could now be found by long experience that the thus obtained finish was perfectly washable but that it covered as a coherent film the surface of the cloth, rendering it rather stiff and impairing the natural soft feel of the textile products. It was therefore the tendency to improve this method by producing alkali-soluble, water insoluble, cellulose ethers differing from the former products therein that degraded compounds were used which did *not give coherent layers.* It was discovered that these valuable modified substances result from a thoroughly controlled degradation. The degrading process of the ethers should go so far that these ethers are deprived of their film forming capacity but still short of becoming water soluble. The methods for degrading cellulose ethers are enumerated: treatment with mineral acids in the cold or at elevated temperatures, with strong sulfuric acid, concentrated or gaseous hydrochloric acid, with bromine or chlorine or with oxidizing compounds (hydrochlorite or permanganate). The products are applied in alkaline solution too and the subsequent reprecipitation is carried out in the classical "Muller- bath" for viscose, i.e. a concentrated aqueous solution of sodium sulfate and sulfuric acid. The amount of degradation can be mesaured by comparing the viscosities of the initial and of the degraded product. The specification indicates that the viscosity has to drop from 0.002 to 0.01 times that of the non degraded ethers.

References, cited by the Patent Office, are amongst others:

U. S. Pat. 2,236,544 (du Pont): xanthating an alkali-insoluble cellulose ether; alkylating it to a point where it is soluble in 6% alkalies and regenerating the ether therefrom.

U. S. Pat. 2,120,417 (Brown & Co.): treatment of cellulose with hypochlorite for degrading it and then treating it with carbon disulfide whereby viscose is formed.

U. S. Pat. 2,157,530 (du Pont): treating undegraded alkali celluloses with an alkylating agent not above 50° C. to obtain low substituted alkylcelluloses.

Other references are:

U. S. Pat. 2,388,764 (Sylvania): very low alkylated celluloses, soluble in very dilute alkalies but insoluble in water (0.06 ethoxyl-groups per glucose unit) as finishing agents.

U. S. Pat. 2,249,754 (du Pont): alkyl celluloses of a low alkyl content (0.1 alkoxyl per glucose unit) soluble in 6% NaOH *near the freezing point* but insoluble in lye of the same concentration at room temperature, used for permanent finishes.

Waterproofing Textiles—Latex combined with cation-active compounds G, 2, 02

U. S. Pat. 2,421,363
(U. S. Rubber Co., Young, May 27, 1947)

The deposition of rubber and water insoluble resins is intended to make fabrics water repellent. The inventor Young obtained U. S. Pat. 2,173,241-2 protecting a method of gradually depositing small amounts of rubber particles on the fibers. In a similar way the inventor's U. S. Pat. 2,340,357-8 described processes for depositing synthetic resins in a flocculated condition. The present invention has the purpose of improving these results by aftertreating the rubber or resin coated material with a cation active agent, for instance with "Triton K 12"—lauryldimethyl benzyl ammonium chloride, "Triton K 60" — Cetyldimethyl benzyl ammonium chloride, Sapamine MS, CH or A and so on. According to an example viscose rayon stockings are padded with a rubber latex suspension to which "Aquarex D" (the sodium salt of monosulfate esters of mixed higher alcohols) is added. The rubber particles are flocculated with ammonium sulfate and formic acid. After some time the content of the impregnating machine is drained off and a commercial cation active agent, dissolved in formic acid, is added. It has been observed that the tack of the deposited layer is reduced and that the rubbing-off or transfer of particles to the hands of the operator or to the metallic parts of the drying forms has been eliminated.

References cited by the Patent office are amongst others:

U. S. Pat. 2,168,535 (I. G. Farben): higher ammonium compounds, such as stearyl-oxymethyl pyridinium bromide, + an halogenated unsaturated ether are used for waterproofing textiles.

Brit. P. 501,288 (Imp. Chem. Ind.): textiles are softened by padding first with a urea-formaldehyde precondensate and thereupon with a quaternary ammonium base.

Other references are:

Brit. P. 580,134 (Latex Proc.): see AMERICAN DYESTUFF REPORTER 1947 p. 466: latex finishes are first coagulated with an anion active agent ("Aquarex D") and aftertreated with a cation active agent, for instance Sapamines. The patent is probably identical with Can. P. 439,898, issued February 25, 1947.

Dyeing Wool—Azo dyes with Chrome-Complex; Formaldehyde added C, 4, 06

U. S. Pat. 2,422,586
(Am. Cyanamid, Royer, Amick, June 17, 1947)

A new method for dyeing metallized azo dyes has been found: the term "metallized azo dyes" refers to acid azo dyestuffs containing molecularly bound chromium metal. The products are known under the tradenames "Neolan", "Palatine Fast", "Inochrome" colors and the like. It has been discovered that aldehydes or aldehyde liberating compounds, added to the dyebaths in quantities between 0.5-10% (calculated on the weight of wool) have the effect of improving the dyeing result in an unexpected degree. Larger quantities of aldehyde should only be added in small portions. Ordinary aqueous formaldehyde, as commercially available, gives good dyeing results as well as paraformaldehyde. Other aldehydes, having not more than 6 C atoms are also suitable (for instance acetaldehyde, glyoxal, etc.). Aldehyde liberating products are, for instance, methylolamines reacted with alkylolamines or phenol-formaldehyde condensates and so on. In one of the examples an acid dyestuff (4-nitro-6-hydroxybenzene — azo-2-aminonaphthalene-5-sulfonic acid) metallized with chromium is used for dyeing wool in the presence of 8% sulfuric acid. This dyestuff, applied according to the normal dyeing method, gives a dull green while by adding 2%

paraformaldehyde to the dye bath a brilliant yellowish green is obtained.

References regarding earlier work, done in this field.

One of the most urgent problems in dyeing dyestuffs of the Neolan type was to reduce the relatively high percentage of acid used in this process. Glue and degradation products thereof, generally water soluble protective colloids (Peregal) have been recommended in U. S. Pat. 2,040,796 (I. G. Farben), quaternary ammonium compounds in Brit. P. 433,230, 436,790 and 436,863 (Ciba) or urea and urea- derivatives in French Pat. 762,985 (Ciba) these references do not pretend to obtain brighter shades but only to lower the necessary quantity of acids in the dyebath. Ger. P. 565,406 (I. G. Farben) teaches that dyeings on chrome mordants become cleaner and brighter by an aftertreatment with formaldehyde—naphthalene sulfonic acid condensates; these products are known as synthetic tanning agents.

Cellulose Solutions—Oxidation with Nitrogen dioxide A, 7, 01

U. S. Pat. 2,423,707
(Eastman Kodak, Kenyon, Unruh, July 8, 1947)

It is interesting to learn from this patent, as well as from the earlier U. S. Pat. 2,231,990 (Kenyon and Yackel, assigned to the same company) that a quite new modification of cellulose results by oxidizing it with NO_2. When cotton or other cellulose material is sufficiently oxidized with NO_2 (or N_2O_4) to become soluble in 2% aqueous alkali solutions it retains substantially its form but it is soluble in the fluids contained in the human body and absorbed by these liquids. This is very important for fabrics, used in surgical operations. On the other hand it might also be desirable to have the threads brought to such a condition that the surface only gelatinizes and becomes slippery so that it cannot adhere to the freshly healed wounds. The rate of oxidation has to be carefully controlled because the material oxidized to a low degree is not soluble at all while in a too far going oxidation the threads become competely soluble and apt to be absorbed. The amount of NO_2 introduced corresponds to a certain percentage of carboxy groups attached to the glucose unit. It has been found that a thread only superficially adhering to the wounds is obtained by imparting a carboxyl-group content of 5-9% per unit to the fiber while a *completely dissoluble* compound is characterized by a carboxyl group content of 15-18%. The treatment is carried out by immersion of the cellulose in a solution of NO_2 in a halogenated hydrocarbon or by dipping it in liquid NO_2 for some time. It is quite possible that the partly or entirely soluble oxycelluloses, obtained in this process acquire some importance for different textile treating (sizing, finishing) purposes too.

Reference:

U. S. Pat. 2,232,990, mentioned in the pre-amble to this specification, protects treating cellulose at a temperature of not more than 20° C. with nitrogen dioxide. Oxidation of the terminal groups of the glucose units is said to occur. This product differs from other compounds termed in practice as oxycellulose therein that it is alkali soluble without changing otherwise the cellulose molecule structure. It may be used as an additive agent to film emulsions and as a sizing compound. A theoretical study of cellulose solutions in mixtures of N_2O_4 and organic compounds, carried out in the Research Laboratories of Eastman Kodak can be found in *Jour. Am. Chem. Soc.* July, 1947, p. 1636. The authors, Fowler, Unruh, McGee and Kenyon, stated here that a new specific solvent for cellulose has been found in a mixture of an organic solvent with N_2O_4. An example for this solvent is 2-nitropropane. A 5% cellulose solution can be obtained with this composition. The solvent has to contain an electronegative group and must not undergo chemical reaction with N_2O_4. Re-precipitation occurs with an excess of chloroform.

Delustering—Melamine-Formaldehyde condensates F. 3, 02

U. S. Pat. 2,424 284
(Brit. Celanese, Olpin et al. July 22, 1947)

The earlier methods of delustering rayon were often based on the use of albumen as a fixing agent for pigments. It is known that albumen renders textiles harsh after drying. The present invention provides a method by which the pigments are attached to the fiber with an aqueous substantially acid free solution of an aldehyde with a base containing a plurality of basic amino groups. The acid used as a curing agent for this condensate is preferably a water soluble solid acid of "moderate strength", for instance, tartaric acid. A characteristic feature consists here of padding first the acid solution, drying the material and thereupon applying a mixture of the pigment (TiO_2, barium sulfate or the like) together with the resin precondensate solution which can be, for instance, of the melamine-formaldehyde type, and drying finally at elevated temperatures. The ratio of formaldehyde to amine base might be 1:1, 2:1 or preferably 3:1 and 4:1. An excess of formaldehyde should be present and the condensation should not go beyond the stage of water-solubility before application to the material. The process has the effect of giving finely divided particles on the goods, the fabrics are quite different in appearance from the normal dulling process. It could be proved that the resins by themselves have no delustering effect at all. An example teaches to add 63 p. of powdered melamine to 170 p. (40%) formaldehyde, previously neutralized with soda ash. This solution is warmed to 80° C. on the steam bath. The pre-condensate becomes a white mass while cooling; it is ground in a mortar and mixed with pigments and a thickener. The fabric to be treated is first padded in a 10% tartaric acid solution, dried and padded with the pigmented melamine-formaldehyde paste, dried at 60-100° C, washed in cold water, dried again and soaped. The effects are said to be well fixed.

References cited by the Patent Office are among others:

U. S. Pat. 2,123,152 (Henry Dreyfus-Rivat): describes a printing method with components, capable of forming resins. These areas form resists after curing when dyed with direct dyestuffs while they absorb readily acid dyestuffs, thus forming two-tone-effects.

U. S. Pat. 2,191,362 (Ciba): resins are obtained from melamine and formaldehyde and fixed at lower temperatures (between room temperature and 100° C), the impregnation consisting of alkylol-melamine-formaldehyde + formic acid. The patent relates to fixing agents in general but not to delustering agents.

U. S. Pat. 2,219,375 (Rohm & Haas): creaseproofing textiles with an ammonium salt of a "moderately" strong acid (tartaric acid) and urea-formaldehyde. Melamine-formaldehyde condensates are not mentioned.

U. S. Pat. 2,350,139 (Ciba): melamine-formaldehyde condensates fixed at low temperatures in the presence of a softening agent of the Sapamine type for creaseproofing and other permanent finishing purposes.

Other references are:

U. S. Pat. 2,331,446 (Ciba): a pre-condensate of melamine nad formaldehyde (ratio 1:4) forming a thick syrup, hardened to a friable mass, which is still soluble in acids, is used as a delustering agent.

Bleaching Textiles—Bluing compounds plus fluorescent agents B, 5

U. S. Pat. 2 424,778 (Lever Brothers—Tainsh—July 29, 1947)

Bleached textile material has mostly a yellowish tint. As far as possible this yellow-white cast is eliminated by a treatment with "bluing" agents such as ultramarine dispersions or in recent times

with solutions containing Indanthrene Blue pastes or similar organic dyestuff pigments. On the other hand it was suggested to use in this event compounds producing a blue fluorescence. One of these compounds is the coumarone derivative *methyl umbelliferone*. An improvement has been found (as disclosed in the present specification) in the *combined use* of these two components. But also other blue fluorescent bodies like naphthylamine sulfonic or disulfonic acid salts of sodium have the same effect. An example gives as approximate quantities, for instance, 0.01% Beta-methyl umbellifer-one and 0.01% Ultramarine both in fine suspension.

References cited by the Patent Office are amongst others:

U. S. Pat. 2,341,009 (Axelrad-Richard Chemical Works): suggests quite generally to partly replace bleaching operations or to make dyeings more brilliant by adding luminiscent substances. Many groups are enumerated for instance extracts of esculine (from the horse chestnut tree), quinine or some fluorescent aromatic sulfonic acids. The effect is due to a brightening by photoluminescence and not to a phosphorescent reaction.

U. S. Pat. 2,089,413 (Imp. Chem. Ind.): substances giving fluorescent effects are applied on dyed textiles or in the dyeing bath itself. Example: substituted amino stilbene sulfonic acid.

U. S. Pat. 2,020,539 (Standard Ultramarine Co.): recommending an ultramarine gel for laundering purposes by mixing the pigment with triethanolamine, mono- or diethanolamines.

The parallel Brit. Pat. has been recently issued under No. 585,549. A special example, mentioned here, is dibenzoylamine-stilbene disulfonic acid. Brit. P. 584,484 (same company) proposes adding these compounds to soaps.

TRADE NOTES • NEW PRODUCTS

• Initial Gifts of $54,250.00 to NETF

The New England Textile Foundation, 68 South Main St., Providence, opened its second campaign to raise $250,000.00 for the four textile schools in New England with a luncheon meeting for campaign personnel at the Statler Hotel, Boston, on October 28, 1947. Initial gifts totalling $54,250.00 were announced at that time from M. T. Stevens & Sons Co. Division of J. P. Stevens & Co., Inc., Packard Mills, Inc., The U. S. Finishing Co., Newmarket Mfg. Co., Uxbridge Worsted Co., Cranston Print Works Co., Mauney Steel Co., Talbot-Mottla, Inc., Worumbo Mfg. Co., Rochambeau Worsted Co., Verney Corporation, Colonial Wool Co., Warwick Mills, Inc., Textile Aniline & Chemical Co., Royal River Mills, Inc., Paragon Worsted Co., and three anonymous donors. This is an average of $2,855.00 per gift.

George T. Metcalf, Executive Secretary of the Foundation, presided at the meeting. Speakers included Abbot Stevens, Treasurer of M. T. Stevens & Sons Co., General Campaign Chairman, who delivered the main address; Leslie B. Coombs, Principal of Bradford Durfee Technical Institute of Fall River; Kenneth R. Fox, President of Lowell Textile Institute, Lowell; George Walker, Principal of New Bedford Textile Institute, New Bedford; and William D. Fales, Chairman of Textile School of Rhode Island School of Design. Mr. Metcalf also outlined Campaign Plans and announced the initial gifts. He stated that the campaign will continue through 1947 and into the first half of 1948 until the goal of $250,000.00 is reached.

Total amount of money voted by the Foundation for the schools to date, it was announced, is more than $140,000.00. This is for scholarships, faculty assistance and new equipment. A booklet prepared by the Foundation gives further details and is available on request.

• Joins Synthron

Fred C. Grant, who has joined the New England Sales Engineering Staff of Synthron, Inc., Ashton, Rhode Island manufacturers of textile chemical specialties. Mr. Grant has been associated with General Dyestuff Corporation for fifteen years, the past eight years of which were devoted to technical sales representation throughout southern New England.

In February, 1946, Mr. Grant reverted to inactive duty as a major in the United States Army following service in the Chemical Corps as technical and tactical observer in the southwest Pacific. He was graduated from Pratt Institute's Course of Industrial Chemical Engineering in 1932. Mr. Grant is a member of the A.A.T.C.C.

• Processing Oils Association

The Processing Oils and Chemicals Association, Inc., held its 16th Annual Meeting at Hotel Claridge, Atlantic City, N. J., on October 16th and 17th. It was noted that this was in the nature of an anniversary celebration as the first meeting of the organization, originally the Sulphonated Oil Manufacturers' Association, was held in New York on October 20, 1931.

J. Everett Allen of Arkansas Co., was elected President for the coming year, J. M. McChesney of Leatex Chemical Co., Vice-President, and H. B. Sweatt, 55 West 42nd St., New York City, Secretary-Treasurer.

The first day of the meeting was largely devoted to a business session and the discussion of current conditions and future prospects in the industry was both interesting and informative. That evening the outgoing President, Harold B. Dohner, was host at dinner, and golf was enjoyed by members the following day at Atlantic City Country Club as guests of Fred Scholler.

• Nopalcol Products

The Nopco Chemical Company, Harrison, New Jersey, is now in production on its Nopalcol products, a series of non-ionic emulsifying agents. These surface active agents are long chain ethylene oxide polymers of fatty acids. Already introduced to a number of industries the Nopalcol emulsifiers are said to have exhibited ready adaptability for solving specific problems in the manufacture of leather, paper, textile, ink and plastics. Other uses are found in cosmetics, paints and adhesives.

It is claimed that, being non-ionic, the Nopalcol materials are not affected by hard water, salts, or dilute acids. The outstanding feature of these compounds is the flexibility of their chemical and physical properties due to alteration of the length of either the fatty portion or the ethylene oxide polymer.

• New Solvay Branch Managers

Solvay Sales Corporation, New York, has announced the appointment of assistant branch managers in Detroit, Philadelphia, and Syracuse, effective November 1.

A. B. Kennedy assumes the newly established post at Detroit, K. M. Dillabough at Philadelphia, and J. H. Kaiser at Syracuse. Each of the assistant managers has been a Solvay sales representative in his respective branch for several years.

• Flock Adhesive

Textile printers are said to report the increasing use of a new flock adhesive which may be stenciled on textile surfaces for applications of cotton, rayon or wool flock. Application is not limited to textiles as the adhesive is widely used for stenciling paper and other surfaces.

According to Ralph McGaffin, manager, Resyn Department, National Adhesives, the product known as Flock Adhesive 970 is of the solvent type. It is viscous, slow drying, and yields flexible prints. Application is equally successful by hand or stencil machine and is particularly recommended by the manufacturer for rayon chenille application.

It is claimed that fabrics printed with Flock Adhesive 970 will withstand repeated dry cleaning.

Technical data and service may be obtained by addressing Resyn Department, 270 Madison, New York.

• Control of Fading Lamps

A practicable, inexpensive, and yet reliable means of controlling the performance of fading lamps has been developed by Herbert F. Launer of the National Bureau of Standards as a solution to the problems arising from the lack of reproducibility among such lamps. This is accomplished by the use of a special light-sensitive paper, which, when placed in the lamp with commercial materials being tested, will fade to an endpoint that can be visually matched with a standard. This provides a very simple method of control independent of the unavoidable variation of radiant energy output of fading lamps.

With increasing use of irradiating units it has become increasingly apparent that these arcs do not function reproducibly from unit to unit or in a given unit from day to day. As a result of recent surveys it has been found that the variations in performance of the same make of lamp are often quite large. Among textile fading lamps, which can be considered typical, it has been found that some of the weakest lamps required from 2 to 3 times as long to produce the same fading as the strongest lamps. Over 1/3 of the lamps included in the group were found to deviate by more than 15 percent from a mean value.

There are a variety of explanations for such behavior but the most generally applicable one is variation of line voltage.

It is obvious that solving line voltage problems as a means of securing uniform arc lamp behavior would be difficult. An attempt has therefore been made to develop a simple, reliable method of gaging the performance of arc lamps by the use of a light-sensitive paper.

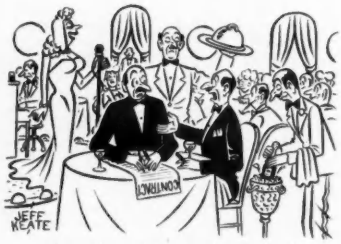
Following considerable experimentation with various dyes and fibers, a suitable light-sensitive paper, designated as Paper A, was produced in the Bureau's pilot paper mill. This paper is sensitive at the desired endpoint, permanent in the dark, and producible in large uniform batches. In use, a piece of the paper is placed in the lamp along with the materials to be irradiated, and exposure is continued until the test paper matches a standardized endpoint, for example 20 Standard Arc Hours, regardless of the actual time elapsed.

The standardized endpoints are produced from the same batch of paper by exposing it to the Standardizing Arc. This Arc has been developed as a means of obtaining accurately measured, definite dosages of radiant energy under reproducible conditions. The light-quantities are measured with "photon counters," light-integrating meters adapted for high-intensity sources. The standardized endpoints thus produced are permanent in the dark and change negligibly during a year's normal use. They are mounted in strip form in a protecting booklet along with plus and minus 10 percent steps, to allow the user to estimate the degree of overexposure or to anticipate the end of the period.

The use of light-sensitive paper should make it possible to set up more rigid specifications of light-stability for all materials where this property is important. The work of the Bureau is still in the experimental stage. Neither the paper thus far developed nor the lamp used in standardization is considered to be the final form of this method for lamp control. In fact, there have been requests from diverse industries for papers useful for controlling exposures over much shorter and longer periods of time, and for use in lamps with water spray. The experience gained from this work has pointed the way towards more sensitive papers of wider scope. Papers useful over exposure periods lasting a few hours to a week are now under development and the radiometric technique is being improved.

• Calco Assistant Director

Dr. Robert S. Long who has been appointed an assistant director of the Organic Section of the Research Department. After receiving his B.S. degree in chemistry from St. Mary's College, Minnesota, in 1936, and his Ph.D. degree from the University of Illinois in 1940, Dr. Long joined Calco on July 1, 1940. On January 1, 1944, he was appointed as assistant chief chemist of the Organic Section and has held this position since that time. Dr. Long is a member of the American Institute of Chemists, and Sigma Xi and Gamma Alpha, honorary societies.



"Do you have to be so darned easy to land? I've only begun to show you the town!"

JEFF KEATE

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• Joins Philadelphia Quartz

The Philadelphia Quartz Company, 121 South Third Street, Philadelphia, Pa., announces the appointment of Kenneth B. King to its sales staff. He will assume sales duties in the North Carolina-South Carolina area with headquarters in Charlotte.

Mr. King attended the Alabama Polytechnic Institute at Auburn, Alabama, for three and a half years before entering the Army in 1943. He received his Bachelor of Science Degree in Textile Chemistry in August, 1947.

Mr. King, who joined the Philadelphia Quartz Company in September, has completed a course of laboratory training in the uses of silicates of soda in industry. He will assist F. Homer Bell, senior Philadelphia Quartz salesman, in the southern area.

• Textile School Deans Conference

Just concluded at Sanford, Maine as the guests of E. L. Ward, President, F. Everett Nutter, Vice President, and other officials of Goodall-Sanford, Inc. was the three day semi-annual autumn conference of the National Council of Textile School Deans.

The program included a public relations panel discussion participated in by E. L. Ward and Mildred Barnwell Andrews and Thomas D. Yutzy of the Committee on Public Relations of the Cotton Textile Industry.

Following an afternoon inspection of the mills the deans met with a number of the plant's executives to discuss desirable specifications for a useful textile school graduate and to explore ways and means of turning out graduates better fitted to meet the demands of the modern textile industries and their ever widening scope of interest.

Problems of school administration discussed were:

Methods that can be devised to secure and train good teachers.

Are there any special curricula designed for G.I.'s? How does G.I. scholarship compare with others?

What changes are desirable in textile curricula?

Size of classes.

Time schedules of subjects taught in textile schools.

Methods of handling laboratory classes under existing enrollment conditions.

Curricula for graduate work.

What is the best limit of students per section?

What are proper teaching loads per instructor?

What academic subjects should be emphasized as being most helpful to the school graduate and to industry?

Policy governing transfers from one school to another.

New courses for future curricula.

Evaluation of hours devoted to subjects in various courses with the purpose of determining similarities and dissimilarities of names of courses so that transfer of credits from one school to another can be handled better.

New members of the National Council elected at the meeting were George H. Coleman, Dean of the Graduate School at the Institute of Textile Technology, Charlottesville, Va.; Bertrand W. Hayward, Director of the Philadelphia Textile Institute; Edward R. Schwarz, Professor of Textile Technology, Massachusetts Institute of Technology; and Simon Williams, Dean of the Lowell Textile Institute.

Those present included Hugh M. Brown, Dean, Clemson College Textile School, Clemson, S. C.; Malcolm E. Campbell, Dean, N. C. State College Textile School, Raleigh, N. C.; George H. Coleman, Dean, Institute of Textile Technology, Charlottesville, Va.; Leslie B. Coombs, Dean, Bradford Durfee Textile School, Fall River, Mass.; Richard S. Cox, Dean, Philadelphia Textile Institute, Inc., Philadelphia, Pa.; Charles H. Eames, Lowell Textile Institute, Lowell, Mass.; W. D. Fales, Head, Textile School, Rhode Island School of Design, Providence, R. I.; Dr. F. M. Feiker, Dean, School of Engineering, The George Washington University, Washington, D. C., Textile Foundation Consultant on Textile Education; Kenneth R. Fox, Pres., Lowell Textile Institute, Lowell, Mass.; Bertrand W. Hayward, Director, Philadelphia Textile Institute, Philadelphia, Pa.; C. A. Jones, A. French Textile School, Georgia School of Technology, Atlanta, Georgia; Dr. Thomas Nelson, Dean Emeritus, N. C. State College Textile School, Raleigh, N. C.; L. E. Parsons, Head, Textile Engineering Dept., Texas Technological College, Lubbock, Texas; Edward T. Pickard, Secretary, The Textile Foundation, Washington, D. C.; George Walker, Dean, New Bedford Textile School, New Bedford, Mass.; and Simon Williams, Dean, Lowell Textile Institute, Lowell, Mass.

• Philadelphia Branch Manager

Alban H. Seitz, who has been appointed Philadelphia Branch Manager of American Aniline Products, Inc., it was recently announced by G. L. Armour, Executive Vice-President, at the company's main office in New York.

Mr. Seitz has previously been a Philadelphia representative for the same company since 1934 and in his new position will supervise sales and technical work in the Pennsylvania, Maryland and south New Jersey territories.

• Glyco Fatty Esters

Commercial production of a long line of products extending practically throughout the entire range of polyoxyethylene (long chain ether alcohol) fatty esters has been begun by Glyco Products Company, Inc., of Brooklyn, N. Y., and Natrium, W. Va., it is announced by Dr. Eugene McCauliff, technical sales director of Glyco.

Ranging from liquids of low freezing point to waxy solids and from water solubility to hydrocarbon solubility, these esters are being applied in the manufacture of emulsions, dry cleaning soaps, cosmetics, pharmaceuticals, lubricants, textiles and plastics.

Members of this non-ionic series of compounds are wetting agents, penetrants and detergents. They are compatible with cationic and anionic surface active agents and, when used in combination with them, are said to give increased wetting and penetrating action at reduced unit cost.

They are used with quaternary ammonium disinfectants to increase detergency. Others are said to be excellent emulsifying agents for hydrocarbons and

"---pot roast, eggs, butter-- I'd say a hundred bucks will be about right"

GARDNER REA

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"Conductor, I'd like to have a word with you about the gentleman in upper six!"

TOM HENDERSON

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insecticides, even under the severe conditions of solutions that contain acids and electrolytes.

Also products of this unusual series are lubricants for textiles, rubber and plastics, plasticizers for synthetics and plastics and spreading and dispersing agents.

The wide range of physical properties achieved by these non-ionic surface active agents results from varying their molecular structure. The variations occur in the polyoxyethylene chain length, in the type of fatty acid used and in their ratios.

• Report on Deterioration

American wartime research for the prevention of deterioration of optical instruments, textiles, synthetic resins, plastics, photographic equipment and other material in tropical climates is summarized in a report now on sale by the Office of Technical Services, Department of Commerce. The research was carried out by the tropical deterioration administrative committee of the Office of Scientific Research and Development.

Orders for the summary report (PB-81801; *Tropical deterioration of equipment and materials;* 91 pages mimeographed, $3.50) should be addressed to the Office of Technical Services, Department of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the United States.

• Completes 50 Years

On October 12, 1947, August Merz, venerable dean of Cyanamid employees, completed 50 years of service with American Cyanamid Company and its affiliates. Industrialist, chemist and public-spirited citizen, Mr. Merz, at 74, is looking forward to continued service with the Company in his capacity as research adviser and consultant.

In 1897, Mr. Merz started his long career with the Company when he joined Heller and Merz, a partnership formed in the late 60's by his father, Henry Merz, and his uncle, Frederick Heller, the first to manufacture ultramarine blue in this country. This valuable pigment, prior to that time, had been supplied to American buyers only by Germany. Mr. Merz, who started as an assistant chemist, saw the plant grow from a small manufacturing unit to a successful producer of such dyestuffs as methyl violet, fuchsine, eosine, nigrosine, rosaniline blue, malachite green, and a line of azo dyes useful particularly in the paper trade and in the paint trade.

August Merz

While at the Newark plant, Mr. Merz became superintendent of the coal tar division, director, secretary, assistant treasurer of the company, and general manager of the plant. In 1929, Heller & Merz was purchased by American Cyanamid Company and when in 1930 operation was assumed by Calco, Mr. Merz was made a vice president of Calco.

A graduate of Cornell University, Mr. Merz received a B.S. degree there after having transferred from City College of New York. Following two years of graduate work at Cornell, he studied abroad at Heidelberg, Germany, and Ecole de Chemin Mulhouse, in Alsace. In 1934, he received an honorary D.Sc. degree from Rutgers University.

President of the Synthetic Organic Chemical Manufacturers Association from 1926 to 1946, Mr. Merz is also vice president of the American Tariff League. He is a member of the American Chemical Society and was honorary chairman of its 108th National Meeting in New York in 1944. Mr. Merz was president of the New Jersey Chemical Society before that organization was merged with the American Chemical Society, at which time he became chairman of its North Jersey Section. He is a past president of the East Orange General Hospital and a vice president of the Newark Eye and Ear Infirmary. Mr. Merz is a member of the American Institute of Chemical Engineers, the American Institute of Chemists, the American Association for the Advancement of Science, the American Pharmaceutical Association, the Chemists Club of New York, and of Phi Gamma Delta.

• Honorary Graduates of Leeds University

Shown above is a photograph of Honorary Graduates at a recent ceremony at Leeds University (England) which was sent to P. J. Wood, Past President of AATCC, by C. M. Whittaker, President of the Society of Dyers and Colourists.

The Chancellor is the one with the most decorative gown and he is the Duke of Devonshire. On his right in the front row is Admiral Cunningham and on his left is Sir William Dobbie, the defender of Malta; Professor Charlton is on the left hand of Sir William. In the second row, reading from left to right, are: T. Edmund Harvey, Professor Nordal of Norway, Professor Polanyi of Manchester University and the next gentleman is unidentified. In the back row, left to right, are: Mr. Halliday, Mr. Whittaker, the Pro Vice-Chancellor and the Vice-Chancellor.

The photograph is a copyright of the Yorkshire Post of Leeds.

Dyeing of Viscose Rayon

(Continued from Page 654)

that the direct cotton dyes can usefully be classified into three classes, viz.—

Class A—Dyes which show good exhaustion in absence of added common salt, and which have good levelling properties.

Class B—Dyes which show poor exhaustion in absence of added salt, and which have poor levelling properties.

Class C—Dyes which show good exhaustion in absence of added salt, and which also have poor levelling properties.

This classification has been shown to be extremely valuable, particularly in the application of these dyes to viscose rayon in cake form[10].

More recently, Lemin, Vickers and Vickerstaff[11], working with cotton, have examined a large number of direct dyes and have concluded that Whittaker's classification (with a minor modification) "as a whole appears to be extremely valuable to the practical dyer, since it provides a good indication of the type of behavior to be expected in practice and the dyeing technique necessary for the production of level dyeings".

It has become fairly widely recognized that the general instructions for the dyeing of the direct cotton dyes normally given in dye manufacturers' pattern cards need radical alteration and expansion so as to take into account the individualism of these dyes and provide information which may be intelligently used by the dye-user in works' practice. Unfortunately, investigators in this field have chosen their own arbitrary experimental conditions, with the result that it has become difficult to relate the results of different workers. This state of affairs was brought to the notice of the Council of the Society in September, 1944, by F. Scholefield, and resulted in the appointment of a Committee whose terms of reference were the establishment of common bases of experimental work and statement of results for investigations on the properties of direct cotton dyes. The conclusions and recommendations of this Committee were published in 1946[12].

Methods for Correcting Variable Affinity

In describing the search for dyeing methods to correct the differences in depth of shade obtained with direct cotton dyes on light- and dark-dyeing viscose rayons, the compounds used can be divided into three groups, viz. (1) alkalis and alkaline salts, (2) β-naphthol, etc., and (3) pyridine.

KALIES AND ALKALINE SALTS—The CORRECTION BY MEANS OF AL- viscose rayons used in this series of experiments were (*a*) specially prepared light- and dark-dyeing skeins, hereafter termed "laboratory light and dark", and (*b*) light- and dark-dyeing skeins picked out of works' dyeings and stripped with hot alkaline sodium hydrosulfite, hereafter referred to as "commercial light and dark".

Unless otherwise stated, 1% Diphenyl Sky Blue FF (Gy) was used, together with 5% common salt, the liquor-yarn ratio being 40:1. Dyeing was carried out at 90° C, for 30 min.

The results obtained with various alkalis, using "laboratory light and dark" rayon, were as follows—

(1) The addition to the dyeliquor of caustic soda to give 0.0125% to 0.0625% solutions resulted in a progressive loss in depth of shade, but there was no correction. When similar quantities of caustic soda were added after dyeing had proceeded for 15 min., almost complete correction was obtained after dyeing for a further 15 min. using a 0.0375% solution, while a 0.0625% solution brought about a reversal, the light-dyeing viscose rayon being more heavily dyed than the dark-dyeing rayon.

(2) Almost complete correction was obtained by adding to the dyeliquor sufficient sodium silicate to give a 40% solution; with a 10% solution there was a great improvement. When added after 15 min. dyeing, almost complete correction was obtained using a 10% solution.

(3) The use of a 5% solution of trisodium phosphate, whether added immediately to the dyeliquor or after dyeing for 15 min., gave complete correction.

(4) Almost complete correction was obtained by adding to the dyeliquor sufficient sodium carbonate to give a 5% solution. No correction was obtained by adding sodium carbonate after dyeing for 15 min., probably owing to its salting action.

As a result of the above experiments it was concluded that the use of caustic soda as a means of correcting light- and dark-dyeing viscose rayons was worthy of further investigation. Consequently, a number of experiments were made using "commercial light and dark" rayon. When using this material the major difficulty experienced was that different samples picked from commercial batches of yarn did not usually show the same variations in dyeing affinity between the light- and dark-dyeing skeins, so that it was necessary to identify the actual "commercial light and dark" rayon used in any particular series of experiments. As a result of these experiments it was shown that—

(1) As with "laboratory light and dark" rayon, no correction could be obtained by adding caustic soda to the dyeliquor before dyeing commenced.

(2) All samples of "commercial light and dark" rayon could be evenly dyed by adding caustic soda to the dye-liquor after dyeing for 15 min. and continuing dyeing for a further 15 min. at 90° C. The quantity of caustic soda required to produce correction varied from sample to sample, but in all cases correction was obtained using 0.025% to 0.075% solutions, success being most frequent with a 0.0375% solution. The addition of too much caustic soda caused a reversal; too little gave incomplete correction.

(3) An aftertreatment of "commercial light and dark" rayon (dyed with Sky Blue FF at 90° C. for 30 min.) with 0.025% to 0.05% caustic soda solutions containing sufficient common salt to give a 0.5% solution also brought about correction.

A number of experiments were then made to correct other direct cotton dyeings on light- and dark-dyeing viscose rayons by the use of caustic soda. In these experiments varying amounts of caustic soda were added after dyeing for 15 min. and dyeing continued for a further 15 min. Comparison was made with dyeings made at the same time but without addition of caustic soda.

With Chlorantine Fast Green BLL (CAC), Benzo Fast Orange 2RL (IG), Benzo Fast Blue 8GL (IG), Chlorazol Fast Orange AG (ICI) and Brilliant Fast Blue 3BX (IG), no correction was obtained. Correction was obtained with Chlorantine Fast Blue GLN (CAC) (0.025% caustic soda solution), Chlorazol Fast Pink BK (ICI) (0.0375% caustic soda solution) and Chlorazol Fast Blue 2BN (ICI) (0.025% caustic soda solution); with Naphtamine Light Blue 4B (IG) there was some correction with a 0.025% caustic soda solution.

With Chlorantine Fast Green BLL, Benzo Fast Blue 8GL, and certain other dyes it was apparent that, under the conditions of dyeing employed, there was some destruction of dye taking place, so the following experiments were carried out—

(1) A dyeliquor was prepared containing 1% Chlorantine Fast Green BLL and divided into two parts. To one part was added sufficient caustic soda to give a 0.04% solution; no addition was made to the other part. Skeins of 150/27 viscose rayon of equal weight were then dyed in these dyeliquors at 90° C. for 30 min. In the case of the dyeing made without the caustic soda addition the true shade of Chlorantine Fast Green BLL was ob-

tained, whereas the dyeing and dyeliquor were dull yellow when caustic soda was present. The effect of strong caustic soda solution (70 Tw.) is to change a Chlorantine Fast Green BLL solution from green to a red brown; if this solution is neutralized the original green color is restored. If the yellow solution obtained by dyeing in presence of caustic soda is neutralized the shade is unaffected, i.e., it remains yellow. It should also be noted that caustic soda and sodium hydrosulfite reduce a solution of Chlorantine Fast Green BLL to the same yellow shade as is obtained with caustic soda and viscose rayon.

(2) If viscose rayon is treated with a 0.4% solution of caustic soda at 90° C. in presence of Caledon Yellow G, the blue color of the *leuco*-compound is obtained very quickly. On removing the rayon from this liquor, the blue *leuco*-compound on the yarn is oxidized to the yellow vat dye.

From these experiments it would appear that the combined action of viscose rayon and caustic soda on Chlorantine Fast Green BLL is one of reduction.

The action of viscose rayon in presence of hot alkali was next investigated by dyeing small skeins from a large commercial viscose rayon skein with 1% direct cotton dye plus 10% common salt in presence of increasing amounts of caustic soda. In each case after dyeing at 90° C. for 30 min. the small skein was removed, the dye-liquor neutralized with dilute sulfuric acid, and a second small skein dyed in the neutralized dyeliquor at 90°C. for 30 min. The two skeins were then compared for indications of loss of depth or reduction caused by dyeing in presence of the known amount of caustic soda. The results are given in Table I.

From Table I it is seen that the direct cotton dyes vary considerably in their ease of reduction. An appreciation of this fact is frequently of importance when dyeing dyes of this type at the boil under slightly alkaline conditions.

The correction of extremes of dyeing behavior by means of alkalies and alkaline salts affords some confirmation of the belief that the dye on dark-dyeing viscose rayon is less firmly held than is the same dye on light-dyeing viscose rayon. In every case where correction occurs, the dark-dyeing viscose rayon invariably loses more dye than the light-dyeing rayon. In fact, if the concentration of the alkaline liquor is too high, a stage is reached where, in the completed dyeing, the dark-dyeing viscose rayon is lighter in shade than the light-dyeing rayon. This relative loss of dye by the two yarns only occurs when the caustic soda is added to the dyeliquor after dyeing has proceeded for some time, or when a dyeing is aftertreated with the alkaline liquor, and is the same with all direct cotton dyes corrected by this method.

CORRECTION BY MEANS OF β-NAPHTHOL, ETC.[15]—It has been shown that, while dyeings of Sky Blue FF on light- and dark-dyeing viscose rayons can be corrected by adding alkali to the dyeliquor, dyeings of Chlorantine Fast Green BLL and several other direct cotton dyes cannot be corrected by this method owing to the ease with which they are reduced by viscose rayon in presence of hot alkali.

It is well-known that, during the dyeing of vat dyes on fabrics containing cellulose acetate rayon, the presence in the dyeliquor of such substances as phenol, β-naphthol, and lactic acid protects the cellulose acetate rayon from the action of the caustic soda. It was decided, therefore, to attempt to "correct" dyeings of Chlorantine Fast Green BLL by adding caustic soda to the dyeliquor in presence of these protective substances, which might possibly prevent reduction of the dye. Preliminary experiments soon showed that the presence of alkaline substances was unnecessary, and that the addition of β-naphthol to the dyeliquor resulted in very greatly improved results as regards the even dyeing of Chlorantine Fast Green BLL on light- and dark-dyeing viscose rayons.

Further trials showed that the best correction is obtained with 40% β-naphthol and 40% salt, and that it is immaterial at what stage the β-naphthol is used, whether before commencing dyeing, during dyeing, or as an after-treatment of the dyeing, provided that the yarn is in the β-naphthol liquor for at least 15 or, preferably, 30 min. It was also shown that correction is better at 90° C. than at 80° C. and 85° C., and does not vary with depth of shade.

A number of other direct cotton dyes were then examined by dyeing on "laboratory light and dark" rayon at 90° C. for 30 min. in presence of 40% common salt, with and without addition of 40% β-naphthol. The following results were obtained—

Practically Corrected—Chlorantine Fast Gren BLL, Benzo Fast Blue 8GL, Benzo Fast Orange 2RL, Diphenyl Chlorine Yellow FF (Gy), Pyralon Orange G (LBH) and Chlorazol Fast Pink BK (ICI).

Considerably Improved—Chlorazol Fast Blue 2BN, Benzo Fast Helio 4BL (IG), Benzo Fast Grey BL (IG) and Benzo Fast Light Scarlet 4BL.

Improved—Brilliant Fast Blue 3BX, Diphenyl Sky Blue FF and Benzo Fast Brown GL (IG).

Slightly Improved — Chlorazol Fast Orange AG.

A compound shade of Diphenyl Chlorine Yellow FF, Benzo Fast Grey BL and Benzo Fast Light Scarlet 4BL showed a very marked difference in depth and tone on the light- and dark-dyeing viscose rayon without β-naphthol in the dyebath, but with 40% β-naphthol and 40% common salt the rayon was practically corrected as regards difference in tone and much improved as regards difference in depth.

Numerous compounds were tried in place of β-naphthol, and other salts in place of common salt. In all these trials 1% Chlorantine Fast Green BLL was dyed at 90° C. using "laboratory light and dark" rayon. The results showed that—

(1) α-Naphthol is as effective as β-naphthol in giving correction, while phenol, resorcinol, pyrogallol, benzoic acid and acetanilide will also give correction if 160% of each is used and if the acidity of the phenol or the benzoic acid is neutralized before use. Amongst the substances used as additions to the dyeliquor in place of β-naphthol were a number of naphthol sulfonic acids. It is worthy of note that none of these sulfonic acids or their sodium salts had corrective properties.

(2) Other sodium, potassium or ammonium salts can be used in place of com-

TABLE I

Effect of Dyeing Viscose Rayon with Direct Dyes in Presence of Caustic Soda

Alkaline Dyeing Losing Depth	*NaOH* %	*Reduction Commencing*	*NaOH* %
Chlorantine Fast Green BLL (CAC)	1	Chlorantine Fast Green BBL	1
Chlorazol Fast Blue 2BN (ICI)	1	Chlorazol Fast Blue 2BN	1
Naphtamine Light Blue 4B (IG)	1	Benzo Fast Blue 8GL	1–2
Diaminogen Sky Blue N (IG)	1	Brilliant Fast Blue 3BX	2
Chlorazol Sky Blue FF (ICI)	0–1	Chlorazol Fast Black BK	2–4
Benzo Fast Blue 8GL (IG)	1–2	Formic Black MTG	4
Brilliant Fast Blue 3BX (IG)	1–2	Naphtamine Light Blue 4B	4
Chlorazol Fast Black BK (ICI)	2	Diazo Geranine B Extra	4
Pyrazol Orange 2R (S)	2	Benzo Fast Light Scarlet 4BL	4
Chrysophenine G (ICI)	2	Diaminogen Sky Blue N	4–6
Formic Black MTG (Gy)	2–4	Chlorazol Fast Orange G	12
Benzo Fast Light Scarlet 4BL (IG)	4	Chlorazol Fast Orange AG	12
Chlorazol Fast Orange AG (ICI)	4	Benzol Fast Orange 2RL	20
Benzo Fast Orange 2RL (IG)	4	Direct Fast Orange SE	8*
Diazo Geranine B Extra (IG)	4–6	Benzo Fast Scarlet 4BS	8*
Chlorazol Fast Orange (ICI)	8	Chlorazol Sky Blue FF	16
Direct Fast Orange SE (CAC)	8*	Pyrazol Orange 2R	8*
Benzo Fast Scarlet 4BS (IG)	8*	Chrysophenine G.	20*

* The experiment was not carried beyond this point and reduction or loss in depth had not started at this point.

mon salt provided that they are not too alkaline or too acid.

Many examples of extreme variations of depth of shade in commercial dyeings (usually blues dyed in the Droylsden works) were examined as regards their correction with β-naphthol. In most cases the dyeing could be corrected either by stripping down and re-dyeing in the presence of 40% common salt and 40% β-naphthol at 90° C, or by aftertreatment of the commercial dyeing with 40% salt and 40% β-naphthol at 90° C. for 30 min. in 40 vol.

The latter method, obviously the more useful in practice, has been used on the large scale with complete success for correcting both yarns and fabrics showing extremes of dye affinity. It should be noted that cellulose acetate rayon is completely rotted by this treatment. Also, the β-naphthol is not entirely removed from viscose yarn by a cold wash. It is best removed by two separate warm (40°-50° C.) washes in either 2% soap (on weight of yarn) or water alone, after a preliminary cold rinse. The apparent fading on exposure to light of some β-naphthol-treated yarns was found to be due to insufficient washing, as the β-naphthol left in the yarn became darker in color on exposure.

CORRECTION BY MEANS OF PYRIDINE—In 1928 Ratelade and Tchetvergoff[14] stated that water-pyridine mixtures would remove the dye entirely from pieces of rayon which were heavily dyed with direct cotton dyes, thus showing that pyridine solutions are excellent solvents for these dyes. In the course of some work with pyridine solutions it was found that, when light- and dark-dyeing viscose rayons dyed with Sky Blue FF were immersed in such solutions, the dark-dyeing rayon lost dye more rapidly than the light-dyeing rayon. This result suggested that addition of pyridine to the dyeliquor might produce even dyeings when viscose rayon showing extremes of dye affinity was dyed with the uneven-dyeing direct dyes. As a result of a large number of trials, it was shown that—(1) Correction can be obtained with a number of direct cotton dyes by adding to the dyeliquor sufficient pyridine to give a 5% solution, either before commencing dyeing or after dyeing for 15 min.; a similar quantity of pyridine is also effective as an aftertreatment. (2) The concentration of pyridine can be reduced by adding formic acid to the dyeliquor, thus, level results on light- and dark-dyeing viscose rayons can be obtained with a number of direct cotton dyes if they are dyed or after-treated in a solution containing 2% pyridine and 2% formic acid.

Although addition of formic acid reduces considerably the quantity of pyridine required, the method is impracticable for use in bulk practice on grounds of expense and because of the obnoxious smell of a pyridine solution of the required concentration.

The only practical method found for correcting light- and dark-dyeing viscose rayons was that involving the use of β-naphthol in presence of common salt.

Vat Dyes

The difficulty of obtaining uniform dyeings on viscose rayon yarns is much greater with vat dyes than with direct cotton dyes. This difficulty is mainly due to the rapidity with which *leuco*-vat dyes are absorbed by viscose rayon. When viscose yarn is entered into a vat dyeliquor the outside layer of threads, being in direct contact with the dyeliquor, is dyed before the threads inside the skein, and the partially exhausted dyeliquor which penetrates to the inside of the skein will not dye the inside threads to the same depth of shade as the outside threads. Consequently, in order to obtain uniform dyeings, the aim should be to decrease the rate of absorption and to increase the rate of levelling. As vat dyes vary considerably in their dyeing and levelling properties, information on these properties should be of practical value.

Experimental

In all the following experiments the dyes were vatted at 60° C. in a small volume of liquor for 20 min., using 10% sodium hydrosulfite (90%) and the requisite quantity of caustic soda. (The quantity of sodium hydrosulfite used was greater than that recommended in dye manufacturers' recipes, but was similar to that used when dyeing on machines of the rotating roller type.) The dye solution was then made up to the required volume with cold water, to which had been added a little caustic soda and sodium hydrosulfite to remove any dissolved oxygen; where a restraining agent was used it was added at this stage. Hydron Pink FF or FB (IG) and Hydron Scarlet 2B (IG) were made up to the required volume with water and the caustic soda, boiled, and the hydrosulfite added just below the boil.

The results given in Tables II and III were obtained as follows—

"STRIKE" TESTS[15]—In making this test a series of 40 vol. dyeliquors (200 c.c.) was prepared, each to accommodate two 2.5 g. skeins of yarn. The dyeliquors were then brought to 60° C., one skein entered into the dyeliquor exactly 1 min. before the other and dyeing continued for 5, 20, 40, 60 and 80 min. After oxidizing, soaping and drying, the two skeins from each dyebath were knitted in alternate broad panels on a single thread circular knitting machine and examined. From the 5-min. dyeings the strike difference was judged and designated by a letter, viz.—

A = No appreciable difference in depth of shade between the two skeins.
B = Appreciable difference.
C = Very marked difference.

TABLE II
Weak Alkali Vat Dyes

Dye	Strike Test at 60° C.	Levelling at 60° C.	Levelling at 90° C.
Indanthren Yellow GK (IG)	A5	Good	Good
Indanthren Orange RRK (IG)	B20	Good	Good
Indanthren Red BK (IG)	B20	Good	Good
Indanthren Olive 3G (IG)	B20	Poor	Poor
Caledon Red 5G (ICI)	B20	Good	Good
Indanthren Yellow FFRK (IG)	B20	Good	Good
Caledon Red Violet 2RN (ICI)	B20	—	—
Paradone Yellow 5GK (LBH)	B20	Good	Good
Indanthren Corinth RK (IG)	B40	Good	Good
Indanthren Gold Orange 3G (IG)	B40	Poor	Good
Indanthren Yellow Brown 3G (IG)	B80	Poor	Fair
Caledon Red X5B (ICI)	C20	Good	Good
Hydron Orange RF (IG)	C20	Good	Good
Hydron Violet BBF (IG)	C20	Good	Good
Caledon Brilliant Violet R (ICI)	C20	Good	Good
Caledon Brilliant Violet 2BS (ICI)	C20	Good	Good
Indanthren Pink B (IG)	C40	Good	Good
Indanthren Gold Yellow RK (IG)	C80	Fair	Good
Indanthren Brown FFR (IG)	C80	Poor	Fair
Caledon Brown G (ICI)	C80	Poor	Fair
Caledon Brown RS (ICI)	C	Poor	Fair
Indanthren Olive GN (IG)	C	Poor	—
Caledon Red RS (ICI)	C	Poor	Fair
Indanthren Brown BR (IG)	C	Poor	Poor
Indanthren Red Brown 5RF (IG)	C	Poor	Poor
Indanthren Bordeaux B (IG)	C	Poor	Fair
Caledon Red BN (ICI)	D40	Good	Good
Indanthren Brilliant Orange BK IG)	D40	Good	Good
Indanthren Orange F3R (IG)	D80	Poor	Good
Caledon Red 2G (ICI)	D80	Poor	Good
Caledon Gold Orange G (ICI)	D80	Good	Good
Hydron Scarlet 2B IG)	D80	Fair	—
Indanthren Brown RRD (IG)	D80	Good	—
Hydron Bordeaux B (IG)	D	Poor	Poor
Indanthren Magenta B (IG)	D	Poor	Good
Ciba Brown 2R (Ciba)	D	Fair	Good
Ciba Blue 2B (Ciba)	D	Fair	Good
Hydron Blue G (IG)	D	Poor	Poor
Durindone Pink FFS (ICI)	D	Fair	Good
Durindone Pink FBS (ICI)	D	Fair	Good

D = Gross difference.

The remaining dyeings were then taken, examined, and to the letter indicating the strike difference the time required for the two dyeings to attain the same depth was appended. Examples of complete strike indexes are—A5 = level after 5 min.; C40 = marked strike difference; level after 40 min.; D = Gross strike difference; not level after 80 min.

LEVELLING TESTS AT 60° C. AND 90° C.—In making these tests three small skeins from the same commercial skein were dyed with 15% of the dye paste (or the equivalent amount of powder) at 60° C. for 30 min. and air-oxidized. One of the dyed skeins was then treated, in presence of an equal weight of undyed viscose rayon, in a 40 vol. blank vat at 60° C. for 30 min. Another dyed skein was similarly treated at 90° C. The blank vats for the weak alkali dyes contained 0.5 c.c. of 70°Tw. caustic soda per 100 c.c. liquor and the vats for the strong alkali dyes 1.25 c.c. of 70°Tw. caustic soda per 100 c.c. liquor, 10% sodium hydrosulfite being used in each case. The yarns were then oxidized in air, washed in cold water, soaped at 90° C. for 30 min. and the levelling effect of the treatments noted.

From the results shown in column 2 (strike test), it is readily seen that at 60° C. the weak alkali vat dyes are, in general, rapidly absorbed by viscose rayon, and that many show good levelling properties at this temperature. Earlier work had shown that the rate of absorption of these dyes is slower at lower temperatures, indicating that it is advisable to start dyeing at a lower temperature. Practical experience confirmed that more level results are obtained by entering the yarn into the vat at 30°-35° C. and after dyeing at this temperature for about 20 min., raising the temperature to 50°-60° C. for a further 20 min., than by dyeing at 50°-60° C. throughout. Typical dyes giving good results by this method are Caledon Red BN, Paradone Yellow 5GK and Indanthren Red BK.

With dyes such as Indanthren Gold Orange 3G, i.e., dyes showing poor levelling properties at 60° C., difficulty was frequently experienced in obtaining level dyeings when using the above method. It is seen from columns 3 and 4 of Table II that several vat dyes showing poor levelling properties at 60° C. show much better levelling properties at 90° C. Consequently, trials were made to investigate the possibility of using temperatures higher than are normal in dyeing this type of weak alkali vat dye. As practical observations had indicated that the use of an increased quantity of alkali tended to give more uniform results, this was also investigated. The results of this work showed that, by increasing the quantity of 70°Tw. caustic soda from 0.5 c.c. to 1 c.c. per 100 c.c. liquor and dyeing at 82° C. (180° F.) throughout, exhaustion of the dyeliquor was retarded and an increased rate of levelling obtained. Subsequently, bulk trials showed that, by giving 4 × 10 min. immersion of the yarn at 180° F., it was possible to obtain uniform dyeings, thus reducing the number of corrections of unevenly dyed shades. Typical dyes giving good results by this method are Indanthren Gold Orange 3G, Indanthren Brown BR, Caledon Olive R and Caledon Brown G.

Wet-tenacity tests of works' dyeings showed that there was a slight decrease in the strength of yarns dyed at 180° F. with 1 c.c. of 70°Tw. caustic soda per 100 c.c., compared with yarns dyed at 140° F. with 0.5 c.c. of 70°Tw. caustic soda per 100 c.c. Further trials showed that by increasing the usual tannic acid addition from 0.2 g. to 0.4 g. per l this slight additional loss was prevented, as is shown by the following figures—

(*a*) Average wet tenacity of 65 weak alkali dyeings dyed at 140° F. with addition of 0.2 g. tannic acid per l. = 0.64 g. per denier.

(*b*) Average wet tenacity of 23 weak alkali dyeings dyed at 180° F. as above, with the addition of 0.4 g. tannic acid per l. = 0.65 g. per denier.

Note—It had previously been shown that the addition of 0.2 g. tannic acid per l. to weak alkali dyeliquors gave yarns having a higher wet tenacity than when dyeing was done at 140° F. in absence of tannic acid.

USE OF RESTRAINING AGENTS—With strong alkali vat dyes, as with the weak alkali types, the principle of commencing dyeing at a low temperature, followed by further dyeing at a higher temperature, still holds. With most of these dyes, however, as is seen in column 2 of Table III, the rate of absorption is very rapid; this is also the case at 30°-35° C. Moreover, very few of these dyes show good levelling properties at 60° C. or at 90° C. Consequently, it has been found necessary to add substances to the dyeliquor which retard exhaustion and so tend to give dyeings initially more level than similar dyeings made without such additions. Typical substances used for this purpose are Albatex PO (Ciba), Peregal O (IG) and certain sulfite cellulose waste liquors. Over a number of years many samples of sulfite cellulose waste liquors were examined as restraining agents for vat dyes, and, while some exerted a strong restraining action, others exhibited no restraining action. Further work showed that the latter type, when used in presence of certain metallic salts, exerted a very strong restraining action. Suitable metallic salts are ferric chloride, ferrous sulfate and magnesium sulfate. The most suitable and economical addition was found to be 6% Glucol (non-restraining type sulfite cellulose waste liquor) and 2% Epsom salt on the weight of yarn to be dyed; it has been used in bulk practice for a number of years, and is added to the dyeliquor after vatting and just before commencing dyeing. It has also proved satisfactory for stripping down vat dyeings which are darker than the required shade. Morton[16] has suggested that positively charged colloidal magnesium hydroxide in presence of a protective colloid (sulfite cellulose waste liquor) is responsible for the restraining action.

In order to determine how much dye is restrained by this mixture, 9 dyeings of Caledon Blue RC, ranging from 0.3% to 6% shades, were made in 40 vol. at 60° C. for 30 min. using 6% Glucol and 2% Epsom salt, and these were matched with the appropriate quantity of Caledon Blue RC dyed without the addition of a restrainer. By subtraction, the quality of Caledon Blue RC restrained was calculated. For example, 3% Caledon Blue RC Powder dyed with 6% Glucol and 2% Epsom salt was equivalent to 2.2% Caledon Blue RC Powder dyed without addition of a restrainer. Therefore, the percentage of Caledon Blue RC Powder restrained was 3 — 2.2 = 0.8%, i.e. 26.6%

TABLE III
Strong Alkali Vat Dyes

Dye	Strike Test at 60° C.	Levelling at 60° C.	Levelling at 90° C.
Indanthren Khaki 2G (IG)	A5	Poor	—
Cibanone Yellow 2GR (Ciba)	B20	Poor	Good
Hydron Yellow NF (IG)	B20	Poor	Poor
Cibanone Red 4B (Ciba)	B40	Poor	Fair
Cibanone Blue 2G (Ciba)	B40	Fair	Fair
Indanthren Yellow 3RT (IG)	B40	Fair	Fair
Paradone Yellow GC (LBH)	B	Fair	Good
Paradone Yellow G (LBH)	C40	Good	Good
Indanthren Brown GR (IG)	D80	Fair	—
Paradone Violet 2R (LBH)	D	Poor	Fair
Indanthren Grey M (IG)	D	Poor	Poor
Caledon Green RC (ICI)	D	Poor	Fair
Caledon Brilliant Orange 4R (IG)	D	Poor	Fair
Alizanthrene Navy Blue (ICI)	D	Poor	Poor
Caledon Orange RRT (ICI)	D	Fair	Fair
Caledon Jade Green XS (ICI)	D	Fair	Good
Cibanone Black 2B (Ciba)	D	Poor	Poor
Paradone Dark Blue BO (LBH)	D	Poor	Poor
Caledon Blue RC (ICI)	D	Poor	Fair
Indanthren Olive Green B (IG)	D	Poor	Poor
Paradone Black 2B (LBH)	D	Poor	Poor

TABLE IV

Effect of Dye Concentration when Dyeing with Strong Alkali Vat Dyes in Presence of 6% Glucol and 2% Epsom Salt

Dye Present (%)	Percentage of Total Dye Restrained		
	Caledon Blue RC Powder	Caledon Jade Green XS Powder	Caledon Green RC Powder
0.3	75	53	67
0.5	64	44	58
0.75	53	41	40
1.0	45	35	30
1.5	33	27	23
2.0	30	20	20
3.0	27	20	20
4.5	18	12	18
6.0	17	10	17

TABLE V

Loss in Color Value of Strong Alkali Vat Dyes due to the Presence of 6% Glucol and 2% Epsom Salt

Dye	Loss (%)
3.0% Caledon Orange 4R Powder (ICI)	30.0
10.0% Paradone Violet 2R Paste (LBH)	25.0
2.0% Paradone Black 2B Powder (LBH)	25.0
3.0% Caledon Blue RC Powder (ICI)	25.0
2.5% Indanthren Yellow 3RT Powder (IG)	20.0
1.0% Indanthren Blue 5G Powder (IG)	20.0
3.0% Caledon Jade Green XS Powder (ICI)	20.0
3.0% Caledon Green RC Powder (ICI)	20.0
2.5% Paradone Dark Blue BO Powder (LBH)	10.0
3.0% Caledon Blue RS Powder (ICI)	10.0
1.5% Anthra Yellow GC Powder (IG)	10.0
2.0% Alizanthrene Navy Blue Powder (ICI)	10.0
2.0% Indanthren Olive Green B Powder (IG)	10.0
2.0% Hydron Yellow NF Powder (IG)	10.0
2.0% Paradone Yellow G Powder (LBH)	10.0

of the original amount was restrained. The results obtained in this way are given in Table IV.

These results show that a higher proportion of the total dye present is restrained when dyeing pale shades than when dyeing heavy shades.

Several other strong alkali dyes were then examined, the quantity of dye restrained being determined for one depth of shade only, viz. a shade approximately equivalent to a 3% dyeing of Caledon Blue RC Powder dyed in presence of 6% Glucol and 2% Epsom salt. The results are given in Table V, which refers to dyeings carried out at 60° C. for 30 min. in 40 vol.

From these experiments it is seen that the strong alkali vat dyes are not all equally restrained by this addition, and that its use entails adding more vat dye to obtain the desired depth of shade. This behavior is characteristic of all the known vat dye restraining agents.

Further experiments showed that the mixture of Glucol and Epsom salt causes incomplete exhaustion of the vat dye without influencing the speed of dyeing at 35° C., and that more uniform dyeing results from the dye which is prevented from dyeing in the initial stages being slowly released by the restrainer during the later stages of dyeing.

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Spore-Rain Technique

(*Concluded from Page* 653)

from the growths suspended above, since growth usually occurs in three to four days when the spores are sprayed directly onto the test specimen.

In practice it would be desirable to inoculate the test specimen as well as the agar on the underside of the top portion of the Petri dish, the growth on the Agar providing an auxiliary source of viable spores constantly infecting the test specimen throughout the incubation period.

With Set No. 1 the test strip showed evidence of mildew attack after the third to fourth day, becoming progressively heavier as the 14 day incubation period progressed. The growth on the agar at the end of the test period was copious; more than sufficient to have insured a constant rain of spores on the test specimen.

Summary and Conclusions

The spore-rain mildew resistance test method, in addition to maintaining optimum temperature, humidity and nutrient conditions, provides that the test specimen be the sole source of organic matter and that all surfaces of the test specimen be subjected to mildew attack. Furthermore, provision is made for the automatic re-inoculation of the test specimen with viable spores throughout the incubation period. The unique features of the method are as follows:

(1) Exposure of all surfaces of the test specimen, and the exclusion of organic matter other than the test specimen, is accomplished by the use of a corrugated porous clay support.

(2) Exposure of all surfaces of the test specimen to mildew attack is insured by inoculating all surfaces of the test specimen with fungus spores suspended in a high-nitrogen inorganic nutrient solution prior to incubation, and by supporting the test specimen on a corrugated porous clay support which insures aerobic conditions on the underside as well as the top side of the test specimen.

(3) Growth of mildew on Agar suspended in the top portion of the Petri dish assembly supplies a rain of viable spores which re-inoculate the test specimen throughout the incubation period.

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Nonionic Detergents in the Scouring of Raw Wool

H. C. BORGHETTY

General Dyestuff Corp.

THE group of nonionic surface active chemicals comprises a large and increasing number of textile and auxiliary products characterized by the absence of the customary sulfonic "polar" group heretofore considered necessary to impart water solubility to bulky surface active molecules.

A few of the more complex "nonionics" possess, furthermore, excellent detergent properties which, coupled with the fact that they are not substantive to fiber and do not give a "fatty" feel, render them valuable for the scouring of raw wool.

Those of the poly ethoxy alkyl aryl type have been found particularly well adapted for wool scouring under practical mill conditions and definitely indicate that the heretofore unsatisfactory performance of synthetic detergents versus soap in a specialty field, has been overcome. This has been accomplished, fortunately, without change in the actual continuous wool scouring equipment, but only a few modifications in the control of operations.

Chemistry of Nonionics

Those on the market today are derived from ethylene oxide $CH_2.O.CH_2$ by polymerization and subsequent condensation yielding chemicals of various chain lengths possessing oxy-ethane units— $C_2H_4 — O —$ which impart the necessary water solubility, possibly by secondary valence effect and capable of maintaining their solubility even when condensed to large bulky molecules. The simplest long chain polymer or polyethylene glycol known to the trade as Carbowax is a soft odorless solid soluble in water and aromatic carbon. Its inert, nonionic properties render it suitable as an ointment base. The more complex ethylene oxide polymers, known as Tweens, are partial esters with polyhydric alcohols and possess emulsifying properties.

Others, typified by $R\ (O\ C_2H_4)_nOH$, where R is a fatty acid or alcohol group are primarily dyeing assistants (Peregal O), emulsifying agents (Emulphors), while those derived from alkyl phenols

known as Igepals, possess the detergent, wetting and emulsifying properties necessary in the scouring of greasy wool. They possess in fact, the following requisites of the ideal detergent for raw wool scouring:

(1) Neutrality
(2) Extreme solubility
(3) Stability to alkali
(4) Stability to hard water
(5) Rinsibility in cold water
(6) Non-substantivity for wool
(7 Stability to heat, oxidation and rancidity.

(Peregal O, Emulphors and Igepals are used as examples of other similar products on the market.)

These properties are not all present in low-titer soaps which for years went unchallenged in the field of wool scouring. All but properties 5 and 6 are possessed by some of the sulfonated synthetic detergents, but such products did not replace soap because their dispersing action is too great and they therefore, allow the dirt particles to remain in suspension and thus retard the settling out process in the bowls of the continuous raw stock scouring machine, causing the scouring liquors to become saturated with excessive amounts of dirt and consequently increasing the redeposition factor of the dirt back onto the wool fiber (see W. Von Bergen—American Wool Handbook). This is not the case with the highly concentrated, pure low-viscosity nonionic detergents.

Factors in Raw Wool Scouring

The natural impurities of the wool fiber are fats and suints which have the function to protect the sheep. In addition, there are various impurities accumulated by the wool according to the surroundings in which the sheep pasture, such as dirt and dust, which often amount to high percentages, and these all must be completely removed together with tar and other extraneous matter used in the branding of the animals. The grease and suint (dried perspiration) comprise from 10-50% of the wool impurities varying from the low percentages in carpet wools to the high in fine wools.

The dirt content can also run as high as 40% while other impurities such as burrs, grasses, etc., usually average 2% and of course often are not removed during the scouring and therefore may require carbonization.

Some of the actual grease content of the fiber, fortunately, is saponifiable or emulsifiable, and thus readily removable in the presence of alkali, providing the temperature of the scouring exceeds the melting point of the wool grease (105-110° F.). This enables tremendous economy of detergent by using soda ash as a saponifier of the fats. The soda ash is therefore consumed proportionately to the intake of greasy wool, but the initial quantities of soda ash must be carefully controlled and preferably confined to the first or second scouring bowls where the wool enters covered with its highly protective coating of grease and buffer salts. The function of soap or of the synthetic detergent is to maintain good emulsion quantities and aid in cleansing particularly in the last bowls where alkali is objectionable and harmful to the fiber.

Herein lies the advantage of synthetic detergents over soap; they have high cleansing efficiency even in neutral baths and do not require high alkalinity for good performance. A good balance and correct distribution of soda ash used in the first bowls, together with the controlled use of a supplementary detergent, gives the wool scourer a means of reducing costs and increasing quality.

Over a period of many years the writer has had the opportunity of observing the many difficulties of successfully carrying out wool scouring trials in a large-scale manner. The task of the wool scourer is not, as some seem to think, a simple one. It has developed over a long period without scientific assistance and the operation can still be looked upon as an "art." The advent of the necessary chemical tools and introduction of simple titration equipment is a boon to those manufacturers ready and willing to use this equipment to their advantage.

The necessity of using soda ash on a fiber which is inherently susceptible to alkali attack necessitates chemical control. The large quantities of wool scoured requires enormous consumption of alkalies and detergents making control of this consumption subject to strict cost specifications. The recent scarcity of soda ash

furthermore introduced the use of caustic soda, which can be added to old scouring baths to convert the bicarbonate formed during the scouring back to soda ash:

$$NaOH + NaHCO_3 = Na_2CO_3 + H_2O$$
$$40 + 84 = 106 + 18$$

thus saving considerably on the actual consumption of alkali. This makes chemical analysis of the scouring bowls imperative. The increase in bicarbonate ratio is, according to Dubeau and Vincent (American Dyestuff Reporter, Oct. 7, 1946), a detriment to wool scouring and the use of caustic might thus become standard practice.

In carrying out trials it is of course evident that as the greasy wool enters the alkaline scouring bowl the soda ash is consumed during the reaction:

$$R\text{-}COOH + Na_2CO_3 = RCOO\ Na + NaNHCO_3$$

The bicarbonate thus builds up constantly because it is not capable of saponifying the fats and new soda ash must then be added in proportion to the entrance of the raw wool stock, otherwise break down of the scouring system occurs. This is also obviated by the addition of caustic soda, although care should be taken in this case that the bicarbonate is not fully neutralized, else the bath loses its buffering capacity and the pH can increase rapidly about 11.2 (soda ash) until the wool fiber is subject to attack. Such attack can be controlled by lowering the temperature to 90-100° F.

Experience indicates that the decrease in scouring efficiency because of bicarbonate buildup can be over emphasized, particularly when it is remembered that straight fresh soda ash bowls at pH 11.2 do not scour as well as old bowls at pH 0.5-10, provided there is sufficient soda ash present to carry out the saponification reaction. This is substantiated in the scouring chart given at the end of this discussion.

System of Scouring Bowls

It has been observed that the nonionic detergents are best suited to scouring raw wools by using each bowl as a separately operated unit where the bath is merely pumped around back to the wool entrance end. If each bowl is equipped with a settling tank or detached settling extractor tank, all the better.

By using the individual bowl system it is felt control of the scouring baths can then be achieved and, furthermore, the settling tank can be partially dropped while running without interfering with the scouring operation. Five- or six-bowl systems are of course superior to three or four bowl units, as they permit the use of a final neutralizing, bluing or bleach bowl.

Large capacity bowls of 3,000-4,000 gallons not only give high production but eliminate any danger of redeposition by giving more rapid movement and less contact of the wool with the suspended dirt particles. The use of dusters or openers prior to entrance of the wool is helpful in giving better penetration of the bath and facilitates settling of the dirt.

Where five-bowl trains are operated the use of the first one as a supplementary "suint" bowl is helpful and eliminates a large proportion of mechanically adhered dust and dirt. The "suint" bowl should be operated by water from the last rinse bowl in order to utilize both the heat and chemicals present therein. The "suint" bowl does not remove any grease from the wool,—it does remove many soluble salts which actually seem to possess scouring properties later in the soda ash bowls. The removal of excess dirt and dust naturally helps the scouring of the subsequent first scouring bowls and help to keep them in operation longer before dropping partly or wholly.

Heavy pressure rubber rolls reduce slippage and maintain the liquid better than the lapped metal roll types. Feed and dissolving tanks for the alkali and detergent should be considered as a "must" while feed pipes give the only sure means of feed control.

1. Soda Ash in First Bowls:

By confining the soda ash to the first bowl only or at least to the first two, it is possible to obtain high concentration where it will do the least damage to the fiber. The use of up to 100 lbs. soda ash per 1000 gallons of bath is not excessive in greasy wools. Such an addition would be objectionable in any of the subsequent bowls.

Once the bath is prepared at 125° F. with soda ash (no other additions are necessary) and the wool begins to enter, the pH drops from 11.2 within 1 or 2 hours (when feeding 1000 lbs. greasy wool per hour at 20% grease) to pH 10.0 and an actual increase in scouring properties is noted. Furthermore, the operation will only show scouring increase if regular additions of soda ash are maintained; usually 10 lbs. soda ash per 100 lbs. grease on the fiber, or roughly 10 lbs. soda ash per 500 lbs. greasy wool at 20% grease content. Excess of soda ash are not harmful because the buffering capacity of the liquor is high and the pH thus can not exceed 10-10.5. Only by the use of caustic soda as mentioned before is it possible to eliminate this safety buffering factor. Titration of the bowl can be easily carried out by using 1/10 N hydrochloric acid with phenolphthalein indicator (to pH 8.3). This gives the true soda ash content which can be expressed in grams per liter.

The rapid decrease of this from, for instance, 50 lbs. per 1000 gals. (= approximately 6 grams per liter) to half the amount after 2 hours, can only be accounted for by continuing the titration of the bath using 1/10 N acid with methyl orange, below pH 8.3 to give the bicarbonate content which, it will be found, corresponds to the lost or converted soda ash. A working chart of a practical run can be readily prepared and pH is often sufficient to tell exactly in what candition the baths are. Even after 10-12 hours running the bowl can be made to scour well provided the soda ash is fed steadily and the speed of train has not introduced so much dirt that settling is made difficult.

Should this occur the bowl must not be dropped completely but preferably only partially at regular intervals of 4-6 hours. In this manner it is possible to utilize the "old" scouring liquor.

The wool on leaving this alkaline bowl should have lost the preponderance of its grease or at least 4/5 of the total, all the water-solubles and part of the dirt. If not, the soda ash content has not been sufficient for the speed of scour and it will be found difficult to economically scour in the succeeding bowls where soda ash cannot be used.

2. Scouring Bowl No. 2: (read as No. 3 if suint bowl is used)

The wool should enter this bowl at a grease content between 3-7% and it can be further reduced only by a good detergent. The last portions of grease are the most difficult to remove and unfortunately must be eliminated by the more expensive chemicals of the scouring system.

Nonionic detergents emulsify the wool grease and dirt and do not require high pH to do so. Because of the ease of rinsibility, the carry over by the wool only, need be considered and no exhaust factor need enter the calculation.

Quantities of 2-5 lbs. Igepal CA Extra per 1000 gals. are necessary at 125-130° F. to prime the bowl, and some alkali (soda ash) can be used to prime also (about 10-20 lbs. per 1000 gals.) The carry over of alkali from the first bowl quickly obviates all necessity of further alkali additions. Igepal additions of 1 lb. per hour or per 1000 lbs. of wool are usually more than sufficient to reduce the grease content from 3-7% down to 1-3%.

The pH standardizes itself to 8.3 because of bicarbonate buildup.

3. Scouring Bowl No. 3: (read as No. 4 when suint bowl is used)

Here the last portions of the grease and dirt are removed together with the suspended dust which has been detached during the mechanical agitation of the travel through the system.

SCOURING CHART—5 BOWL MACHINE

AUSTRALIAN WOOL—Yield 70%, Grease Content 15%, Dirt 15%
Production Rate 1,000 lbs. per hour-grease Stock

	Bowl #1—2500 gals.—Temp. 125° F.						Bowl #2—2500 gals.—Temp. 125° F.					Bowl #3—1500 gals.—Temp. 125° F.					Bowl #4—1000 gals. —Temp. 125° F.			Bowl #5 (Rinse) —1000 gals. Temp. 125° F.	
	Lbs. Wool	*pH*	*Soda Ash*	*Grease Extraction*	*Soda ash by Titration lbs. per 100 gals.*	*Bicarbonate by Titration lbs. per 100 gal.*	*pH*	*Soda Ash*	*Igepal CA Extract*	*Grease Extraction*	*Soda Ash by Titration lbs. per 100 gals.*	*Bicarb. by Titration lbs. per 100 gal.*	*pH*	*Soda Ash*	*Igepal CA Extra*	*Grease Extraction*	*Bicarb. by Titration lbs./100 gal.*	*pH*	*Igepal CA Extra*	*Grease Extraction*	*pH*	*Grease Extraction*
Start	....	11.2	250 lbs.	.....	10 lbs.	none	11.2	100 lbs.	5 lbs.		10 lbs.	None	7.0	none	5 lbs.	....	none	7.0	2 lbs.	....	7.0	0.4%
After 1 hour	1000	10.8	add 10	7–8%	9.5	0.5	10.8	add 5	½	4%	9.5	0.2	7.5	use only in case of poor scouring	½ lb.	1.5%	....	7.2	....	0.5%	7.0	0.4%
2	2000	10.4	add 10	7–8%	9.0	1	10.2	add 5	½	4%	9.0	0.5	7.8		½ lb.	1.2%	....	7.5	½ lb.	0.5%	7.2	0.4%
3	3000	10.0	add 10	7–8%	9.0	2	9.8	add 5	½	3%[3]	9.0	1.0	8.0		½ lb.	1.2%	0.1 lb.	7.5	....	0.4%	7.2	0.4%
4	4000	9.5[1]	add 10	7–8%	8.5	3	9.5[2]	add 5	½	3.5%	9.0	1.5	8.0		½ lb.	1.0%	0.2 lb.	7.5	....	0.4%	7.2	0.4%
5	5000	9.5	add 10	7%	8.5	4	9.5	add 5	½	3%	9.0	2.5	8.0		½ lb.	1.0%	0.2 lb.	7.5	½ lb.	0.4%	7.5	0.3%
6	6000	9.5	add 10	7%	8.5	6	9.0	add 5	½	3%	8.5	3.0	8.0		½ lb.	1.0%	0.3 lb.	7.5	....	0.4%	7.5	0.3%
7	7000	9.5	add 10	7%	8.0	7	9.0	add 5	½	3%	8.5	4.0	8.0		½ lb.	1.0%	0.4 lb.	7.5	½ lb.	0.4%	7.5	0.3%
8	8000	9.5	add 10	7%	8.0	8	8.5	add 5	½	3%	8.5	4.0	8.0		½ lb.	1.0%	0.4 lb.	7.5	....	0.3%	7.5	0.3%
9	9000	9.5	add 10	7%	8.0	9	8.5	add 5	½	3%	8.5	5.0	8.0		½ lb.	1.0%	0.4 lb.	7.5	½ lb.	0.3%	7.5	0.3%
10	10000	9.5	.....	7%	7.5	9	8.5	....	..	3%	8.5	5.0	8.0		....	1.0%	0.5 lb.	7.5	....	0.4%	7.5	0.3%
Totals 10 hrs.	10000	..	340 lbs.	...	..	—	..	145 lbs.	9½ lbs.	..	..	..	..	..	9½ lbs.	....	....	..	4 lbs.	....	..	....

[1] It is important to observe the rapid drop in pH and the eventual stabilization at pH 9.5. This corresponds to the drop in soda ash and the rapid increase in bicarbonate content. It is thus evident that the high soda ash additions are not cumulative.

[2] Note the reduction in pH from 11 to 9.5 as the soda ash is converted to bicarbonate.

[3] Note the scouring efficiency of Igepal CA Extra as shown by the reduction in grease content from 7 to 3%.

No soda ash is required and a prime of 2-5 lbs. Igepal CA Extra per 1000 gals. is sufficient. Temperature of 125-130° F. is optimum for best emulsification. pH at start is 7, but climbs steadily to pH 8.5 because of carry over from the preceeding bowls. Increased alkalinity of course helps the scouring, but the nonionic detergents are sufficiently effective at lower pH (7-9).

The low pH assures complete elimination of the alkali in the following rinse bowl, and thus eliminates any danger of alkali being dried into the fiber later. Whenever accumulations of alkali occur in the last bowls they are not eliminated during the rinse and the wool becomes slightly harsher.

4. Rinse Bowl:

pH 7.

No addition here—running warm water is best—temperature 100-120° F. gives complete elimination of the last traces of direct and of nonionic detergent, therefore no feel is imparted to the fiber and no chemicals are present during the later drying and dyeing operations, to affect the properties of the wool.

The accompanying chart represents a practical mill run which it is hoped fills in the gaps and clarifies the point we have endeavored to cover.

—◆ ◆—

• Chicago Chemical Exposition

"The date for the Fifth National Chemical Exposition by the Chicago Section of the American Chemical Society for 1948 has been set for October 12 through 16 at the Chicago Coliseum," says Dr. L. E. Clifcorn, Chairman of the ACS Exposition Committee.

It is planned to have the floor plan for the '48 Show in the hands of former exhibitors on the morning of January 5, 1948. "These former exhibitors will have about two weeks in which to select their space before it is thrown open to others," says Dr. Clifcorn.

"The 1946 Show was a sell-out," Dr. Clifcorn states, "so it is hoped the present building program which already has provided an attractive new entrance to the Coliseum will be completed to the point of providing added ground floor exhibit space in time for the 1948 National Chemical Exposition."

Marcus W. Hinson has been engaged again to manage the details of the Exposition. Mr. Hinson served in a similar capacity for each of the former expositions.

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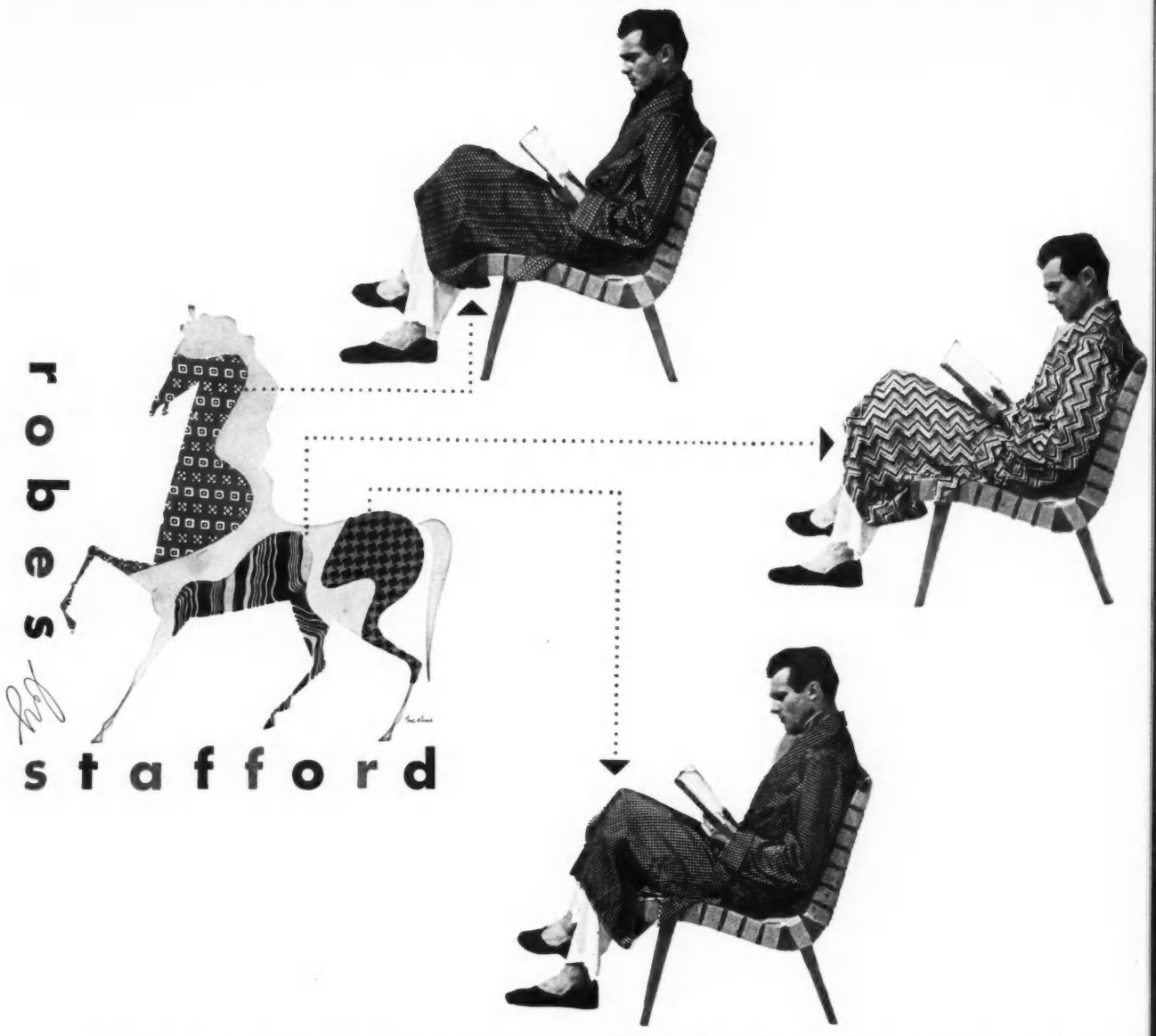

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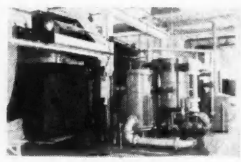
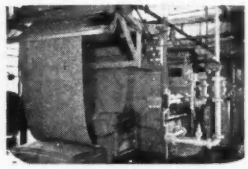


Installation in a New England mill making women's woolens.



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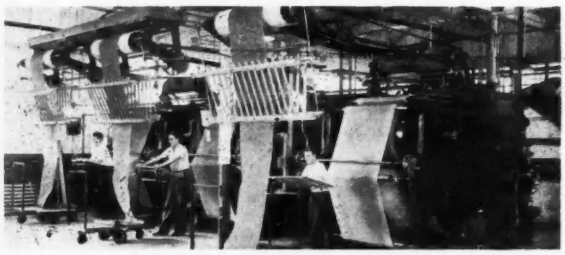

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Use ATCO Products

QUALITY RICHMOND PRODUCTS

MERCOPEN

For mercerizing

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The mercerizing penetrant which is water soluble
Faster Penetration
Easier rinsibility
No scum in caustic

Ask for samples

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RICHMOND OIL, SOAP & CHEMICAL CO., Inc.
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A COMPLETE LINE OF
DYESTUFFS
for all branches of
TEXTILE DYEING
AND PRINTING—
PAPER AND LEATHER

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Specializing in fast colors

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147-153 Waverly Place
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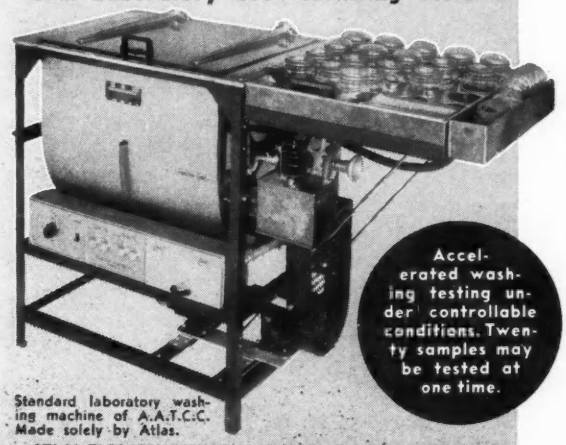
WAREHOUSES IN NEW YORK and CHARLOTTE, N. C.

LAUNDER-OMETER

for Washing Tests—Mechanical Action—Color Fastness and Staining Tests—Detergent Tests—Fastness to Fulling Tests—Leather Dyeing Tests—Dry Cleaning Tests—Vat and Sulphur Dye Tests—General Laboratory Use—Shrinking Tests.



Accelerated washing testing under controllable conditions. Twenty samples may be tested at one time.

Standard laboratory washing machine of A.A.T.C.C. Made solely by Atlas.

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WEATHER-OMETER ★ LAUNDER-OMETER ★ FADE-OMETER

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BOMBAY No. 3 (INDIA)

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DIRECT IMPORTERS STOCKISTS

Are interested in the import of the following groups of Dyestuffs:

DIRECT	ACID
BASIC	DIAZO
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FAST SALTS	RAPID FAST

Also

HEAVY AND FINE CHEMICALS

and

CAMPHOR

Offers Invited

"Here's What We Want in a Dyebox,"

said Textile Dyers

1. Less time for loading, heating, lacing, doffing, cleaning.
2. Greater saving of steam and water.
3. Production of cleaner, higher quality work.

And Here's the Box We Designed

As specialists in fabricating stainless steel textile equipment, we present this new dyebox for quality dyeing. It assures all the time and money savings that dyers demand in new equipment — all the convenience of an open type box combined with the advantages of a fully enclosed box.

The NEW BLICKMAN DYEBOX

Stainless Steel and Fully Enclosed

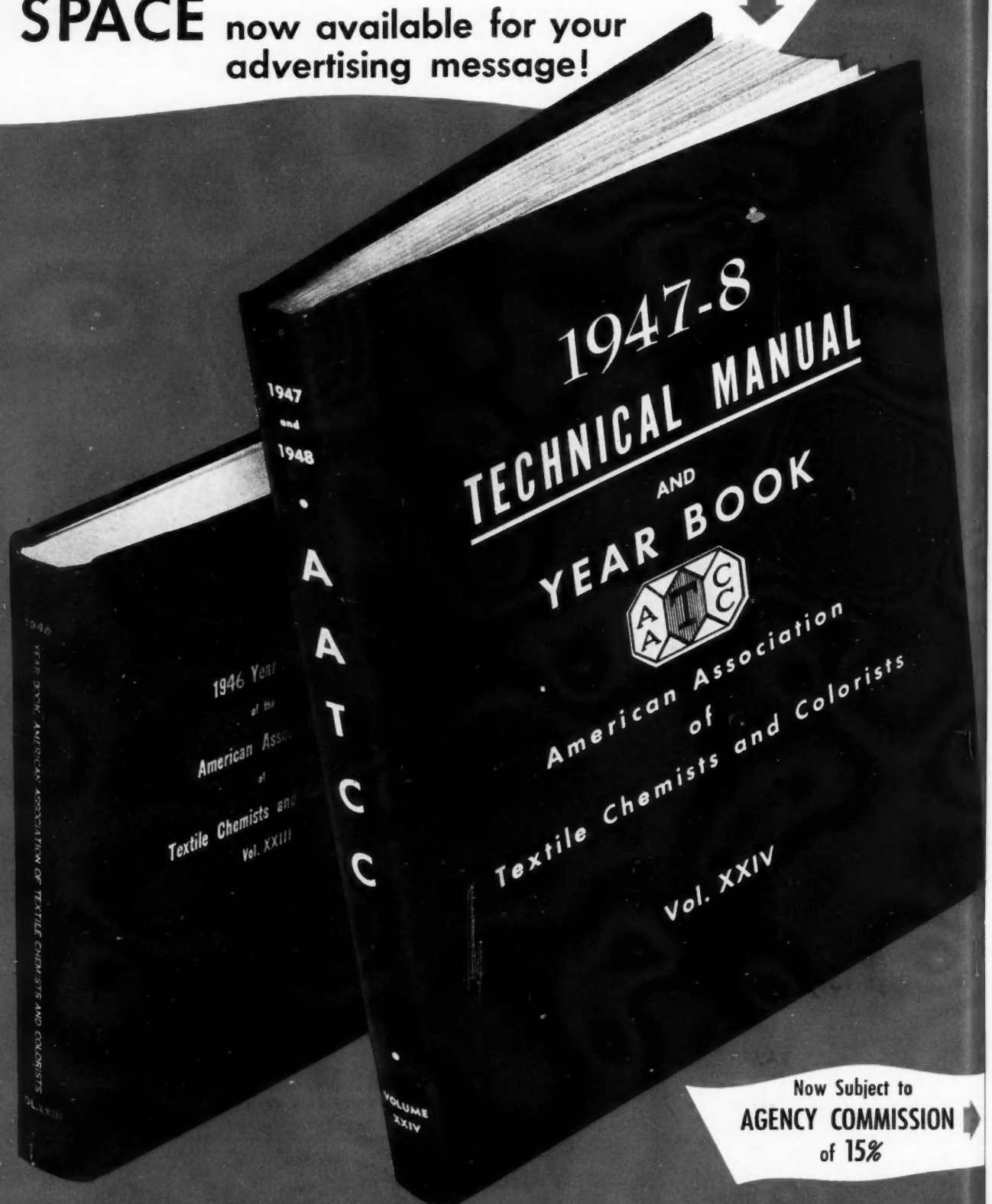
Write for further information

S. BLICKMAN, INC.

111 GREGORY AVENUE • WEEHAWKEN, N. J.

Manufacturers of stainless steel textile equipment, dye boxes, linings, cylinders, dry cans, rolls, hoods, tanks

Over 100% MORE TYPE SPACE now available for your advertising message!



Now Subject to
AGENCY COMMISSION
of 15%

FROM time to time members of the American Association of Textile Chemists and Colorists have suggested that changes be made in the physical makeup of their volume, namely, to make the contents easier to read and the book more comfortable to handle. Also, a change in the title was suggested, as the term "Year Book" was thought to be too general and one that did not suggest the valuable contents of the book. All of these and other suggestions were acted upon by the Publications Committee of the Association who approved them as follows.

1. **There will be no volume published during 1947, but the edition which will appear during 1948 will bear the year date 1947-8.**
2. **The present title "Year Book" will be changed to "TECHNICAL MANUAL and YEAR BOOK," the emphasis being placed upon the first two words.**
3. **The type page size will be increased to 7 x 10 which is the same as the American Dyestuff Reporter and the trim size will be 8⅛ x 11¼.**
4. **This increase in size from 4½ x 7 to 7 x 10 will make product advertising more valuable inasmuch as it increases copy space over 100% and permits the use of regular publication plates, thereby eliminating the expense of making special sized cuts.**
5. **Instead of the single column type page, the text pages of the new volume will be set three columns to the page, which will definitely be easier to read.**

In view of the fact that no volume will be published during 1947, the advertising placed in the 1947-1948 edition will be billed in 1948 as follows:

Full page—$200. Half page—$125.
Color—$60 net. Bleed—10% additional

MECHANICAL REQUIREMENTS

Full page type size—7″ wide x 10″ deep

Half page vertical—3⅜″ wide x 10″ deep

Half page horizontal—7″ wide x 4¾″ deep

Bleed—8¼″ x 11½″

Screen—110

Forms close May 1, 1948

Regular 7″ x 10″ advertising plates can be used—also regular vertical and horizontal half page plates. No quarter pages will be accepted.

★

THE INDEX OF COMPANIES WHO USED SPACE IN THE LAST EDITION IS A "WHO'S WHO" IN THE AMERICAN TEXTILE CHEMICAL INDUSTRY.

★

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Zinsser & Co., Inc.
Zurn, O. F., Co.

Send your space reservation to the Howes Publishing Company, One Madison Avenue, New York 10, New York, who act as Agents for the American Association of Textile Chemists and Colorists.

PENETRANTS • DETERGENTS • SOFTENERS • REPELLENTS • FINISHES

BURK-SCHIER

BURKART-SCHIER CHEMICAL CO., CHATTANOOGA, TENN.

• CLASSIFIED ADVERTISEMENTS •

CONFIDENTIAL EMPLOYMENT SERVICE—For Dyers, Chemists, Colorists, Managers, Superintendents and others seeking positions and for employers seeking men. Many positions paying attractive salaries, open for capable men. Charles P. Raymond Service, Inc., 294 Washington St., Boston, Mass. Over 45 years in business.

WANTED: TEXTILE CHEMIST for well established small Southern firm to assist in expanding line of textile auxiliaries and finishes. Experience in development or manufacture of textile auxiliaries required. Give full details, including salary requirements. Write Box 302.

POSITION WANTED: Ten years of lab experience with leading dyestuff and chemical manufacturer. Five years of practical dyehouse and lab experience on rayon skeins and cakes. Desire opportunity as technical representative with manufacturer of dyes and chemicals. Age 35. Letter of interest brings resumé. Write Box 304.

WANTED: Chemist, B.S., with at least several years' Research or Development experience on wool; to carry out research and development work on fur. Permanent position for qualified man with large company in vicinity of New York. Salary commensurate with education and experience. Write Box 313.

Leading Manufacturer in New York City invites applications of Graduate Chemists having some experience in protein textile fibers. Write stating qualifications and experience. Write Box 322.

WANTED: YOUR SURPLUS DYESTUFFS
Vat powders, acid, chrome, direct, and naphthol dyes wanted by this substantial organization. Write, wire, or phone Shepard Chemical Corporation, 117 Liberty St., New York 6. Phone: WOrth 2-7839.

DYESTUFF—CHEMICALS: Top Prices paid for excess and surplus lots, particularly Direct Blacks, Benzo Purpurine 4B, Indigosols, Vats, Malachite Green. Write Box 332.

POSITION WANTED: Quality Controller—The man described in this ad knows the business of rayon dyeing and roller printing forward and backward. He is accustomed to heavy responsibility and is a good trouble shooter in all plant activities. He has creative ability, tempered by long practical experience. His chemical background, skill and experience warrants a fairly high salary. Interested only in a big job that needs doing. Write Box 330.

POSITION WANTED: Textile Chemist, 42, Ph.D. with long practical experience in bleaching, dyeing, finishing, development and research, at present employed, seeks executive position in mill or laboratory. Write Box 327.

SMALL JIG DYEING & FINISHING PLANT WANTED, OR JIG & BOX PLANT. METROPOLITAN AREA PREFERRED. WRITE BOX 328.

POSITION WANTED: Woolen and Worsted skein yarn dyer. Thorough knowledge of acid, chrome and alizarine colors for knitting and weaving. Artificial and daylight matchings. Twenty-five years practical dyehouse experience. Age 45. Now connected with one of the long established dyehouses in the East. Write Box 314.

WANTED: PACKAGE DYEING MACHINE
One stainless steel 50-100 pound package dyeing machine. Must be in good condition. Write Box 338.

MALE HELP WANTED: Secondhand in dyehouse, experienced in package dyeing, also open tub dyeing of knit goods, cotton-and-rayon, and combinations wool and cotton. When replying state salary expected to Box 337.

WANTED: Experienced detergent chemist for research work on detergent problems in textile and laundry fields. Location Great Lakes area. Please give full details and salary requirement. Write Box 336.

(Additional Classifieds on Page XXXVII)

QUALITY PERFORMANCE

We EXPORT...

DYESTUFFS

and

AUXILIARY CHEMICALS

for the

Textile, Leather, Paper and other industries

■

L. L. RONA & CO., INC.

Established 1929

40 Exchange Place
New York 5, N. Y.

Cable Address
"ELRONA"

• CLASSIFIED ADVERTISEMENTS •

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $7.50 per column inch or less per insertion.

HOSIERY DYER WANTED: Top-notch hosiery dyer, fully experienced on nylon and combination hosiery dyeing, wanted by New York Metropolitan commercial dyeing company. Excellent opportunity. Reply in confidence to Box 334.

AVAILABLE: MANAGERS ASSISTANT—Head of Application Lab. Experience 21 years Dyestuff business, Laboratory, Demonstrating, Sales, Colorist for Dyestuff Manufacturer, Soluble Vats, Acid, Chrome, Direct Acetate Dyeing and Printing. Lowell Textile graduate. Salary minimum $6500. Write Box 335.

Wanted
DYESTUFFS-CHEMICALS
Top prices paid for inventory
and surplus dyestuffs and chemicals
of all types.
Sanders & Sloat, Inc.
180 Broadway, New York 7, N. Y.
BEekman 3-5894

(Additional Classifieds on Page XXXVI)

Laurel Brand

means

better, more efficient, lower cost finishing for your

For over thirty-seven years Laurel has met successfully myriad challenges of leading dyers, bleachers and finishers with better, more efficient processing agents. Ask Laurel Technicians for their recommendations.

Laurel Boil-Off Oils and Compounds · Laurel Emulsions and Softeners · Laurel Hosiery Finishes · Laurel Nylon Finishes · Laurel Rayon Oils · Laurel Textile Oil · Laurel Wool Oils · Laurel Special Finishes

soaps, oils, finishes

LAUREL SOAP MANUFACTURING CO., Inc.

Wm. H. Berlolet's Sons

ESTABLISHED 1909

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Chattanooga, Tenn.
Charlotte, N. C.

OFFICES:
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Philadelphia 34, Pa.

10 PRODUCTS of PROVEN DEPENDABILITY

WHICH SHOULD WARRANT YOUR ATTENTION

*AQUAROL: A water repellent for processing woolen, cotton and rayon fabrics, also produces excellent results in splashproofing or finishing all types of hosiery.

*PARAMINE T A: A cation active softener for processing cotton and rayon cloth to obtain a soft, smooth, pleasing finish.

ANTHOMINE: Auxiliary used in all wool dyeing processes to produce a uniform shade and impart a soft pleasing hand to stock, yarn and cloth. Improves exhaustion of dye bath and increases color yield. Very effective for levelling shade of tippy and mixed wools.

*PARAPON S A: A highly efficient leveler and softener for dyeing and finishing all types of yarn, cloth and hosiery to produce a uniform dyeing and a soft full hand.

*ARIPEL F S: Finish and gas inhibitor for processing dyed acetate rayon—produces a soft, full feeling finish and prevents gas fading of the color.

*LANITOL F: A synthetic detergent possessing exceptional scouring and washing properties for processing wool, cotton, rayon or nylon.

*ALGEPON V A: Auxiliary used in dyeing vat colors to retard reoxidation of the reduced bath and produce a solid and uniform shade—also effective in stripping vat dyeings.

*CULOFIX: Used as an after treatment in last rinse to prevent bleeding of direct dyed cotton or rayon in water.

*DIAZONOL A C: For boiling out cotton cloth in pressure or open kiers to produce greater absorbency and cleaner material. Excellent for pre-boiling knitted cloth in preparation for chlorine bleach. Also used with good results for boiling out cotton or rayon cloth on the jig.

*TETRANOL: A rapid wetting and penetrating agent. Active in acid, alkaline and salt solutions and not affected by hard water, may be used in all types of dyeing operations to insure positive penetration of color and a uniform and solid shade.

And a complete line of Oils, Chemicals, Softeners and Finishes for Wet Processing All Textile Fibres

*REG. U. S. PAT. OFF.

ARKANSAS CO., INC.

Newark, New Jersey

Manufacturers of Industrial Chemicals for Over 40 Years

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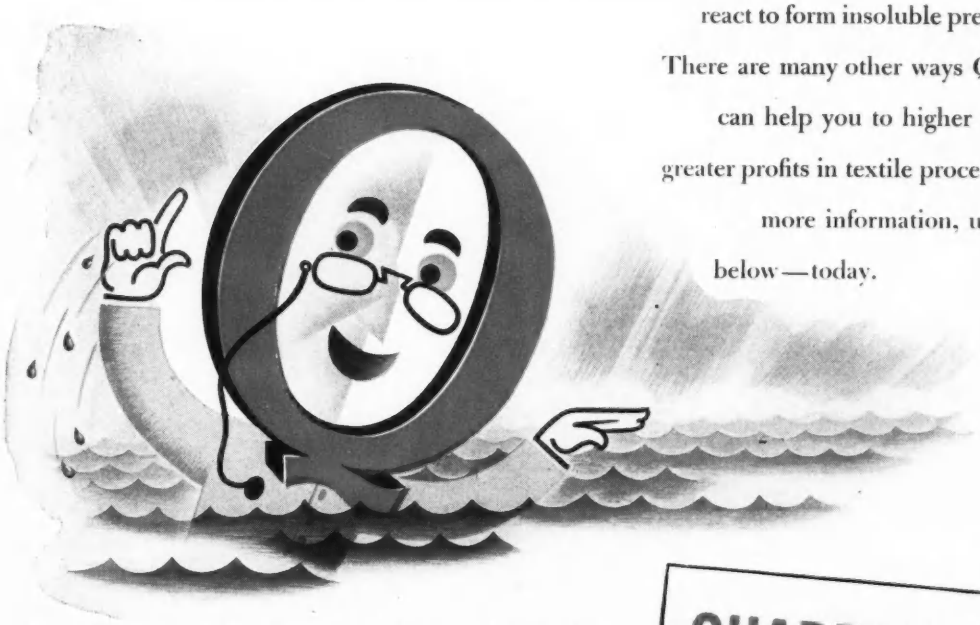
QUADRAFOS* conditions water for more profitable processing

In at least 27 vital textile processes QUADRAFOS can help you get rid of hard water precipitation troubles. Insoluble metallic soap deposits need not dull fabrics or foul equipment. Soaps, alkalis and dyestuffs get a real chance to go to work when QUADRAFOS teams up with water to eliminate processing headaches. . . . Yes, the water's always fine when you use QUADRAFOS. That's because QUADRAFOS ties up calcium, magnesium and other metal ions so they can't react to form insoluble precipitates . . . There are many other ways QUADRAFOS can help you to higher quality and greater profits in textile processing. For more information, use the coupon below—today.



softens water without precipitation...deflocculates ...redissolves precipitates...promotes free rinsing

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RUMFORD CHEMICAL WORKS
Technical Service Department
20 Newman Avenue
Rumford 16, Rhode Island

Please send me further information about the use of QUADRAFOS in textile wet processing. I'm particularly interested in:

- ☐ Raw wool scouring
- ☐ Piece goods scouring
- ☐ Kier boiling
- ☐ Reducing bleach requirements
- ☐ Brighter, more uniform dyeing
- ☐ Viscosity control of printing pastes

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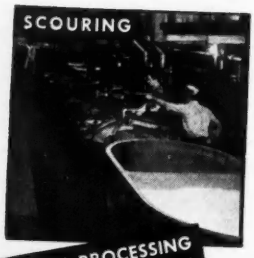
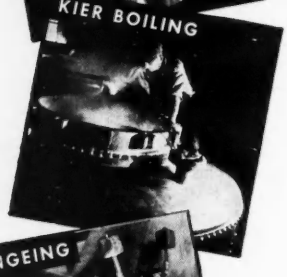
City ..... *State* .....

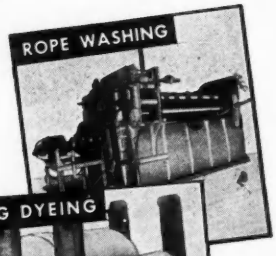
Jack of all Trades

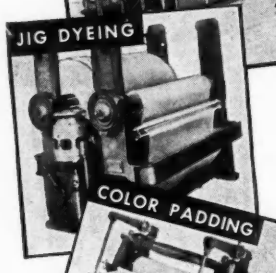
—and Master, too!

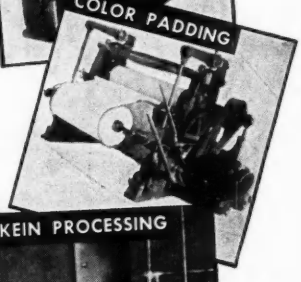
TRITON 770











Mill men know TRITON 770 CONCENTRATE as a dependable detergent, wetting and emulsifying agent. But did you ever realize how *many* different jobs TRITON 770 CONCENTRATE does in the textile mill? Glance over the applications shown on this page . . . they show *some* of the processes in which this dependable chemical helps in making textile mill operations more efficient and more economical. Write for full information on how you can use this fine chemical to advantage.

THE SERVICE THAT BUILT OUR BUSINESS CAN HELP YOURS

Our business has been built largely on the practical help we have been able to give our customers, right in their own plants, in adapting Rohm & Haas products to their needs.

Our representatives are men with technical training and practical experience in the use of industrial chemicals. Call in a member of our textile chemicals department when you need assistance in choosing or using . . .

Chemicals for Fine Textiles

TRITON *is a trade-mark, Reg. U. S. Pat. Off.*

Represented in Canada by Rohm & Haas Company of Canada, Ltd., Toronto; and in South America by Cia. Rohm y Haas, S. R. L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Manufacturers of Chemicals including Plastics • Synthetic Insecticides • Fungicides • Enzymes • Detergents
Germicides • Chemicals for the Leather, Textile, Ceramic, Rubber, Paper, Petroleum and other Industries

We're making a slight change...

Effective November 1st, 1947, The Solvay Process Company and Solvay Sales Corporation have been merged into their parent company, Allied Chemical & Dye Corporation. The business of the merged companies will be continued under the name "THE SOLVAY PROCESS DIVISION, Allied Chemical & Dye Corporation" and "SOLVAY SALES DIVISION, Allied Chemical & Dye Corporation," respectively—with no change in personnel. Neither will there be any change in the traditional quality of Solvay products . . . nor in the dependable Solvay service which has been helping American industry for over sixty-six years.

In other words, except for changing the lettering on the doors, our sales offices will continue as before at the addresses listed below.

SOLVAY SALES DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector St., New York 6, N. Y.

Branch Sales Offices:

45 Milk Street	Boston 9, Mass.
212 South Tryon Street	Charlotte 2, N. C.
1 North LaSalle Street	Chicago 2, Ill.
3008 Carew Tower	Cincinnati 2, Ohio
926 Midland Building	Cleveland 15, Ohio
7501 West Jefferson Ave.	Detroit 32, Mich.
921 Main Street	Houston 2, Texas
1107 Pere Marquette Bldg.	New Orleans 12, La.
43 Exchange Place	New York 5, N. Y.
12 South 12th Street	Philadelphia 7, Pa.
1107 Gulf Building	Pittsburgh 19, Pa.
3615 Olive Street	St. Louis 8, Mo.
Milton Avenue	Syracuse 1, N. Y.

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KOVALENKO

Sales Appeal

with Drytex* NATURAL FINISH WATER REPELLENT

This new wax-emulsion type water-repellent has many advantages. MORE WAX . . . no other water repellent equals Drytex for wax content. EASIER TO MAKE UP . . . unlike pastes and heavier liquids, Drytex pours like milk. IT ABSOLUTELY DOES NOT FOAM . . . you know what that means to you!

Drytex is ideal for the textile trio—wool, cotton, and rayon. Correctly applied, it has a water repellent rating by AATCC Standard Test of 100!

Stable in storage, stable in the bath, Drytex offers many economies—while keeping the natural draping qualities of fabrics, adding full water repellency. Try a sample. Compare. You'll see Drytex is best by test.

ROYCE CHEMICAL CO.

*Reg. Trade Mark

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